

STEPHENS ELECTRONICS, INC

technical manual

811-D

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RSC 766-7191

PROFESSIONAL AUDIO
RECORDER/REPRODUCERS

811-D

STEPHENS ELECTRONICS, INC.

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This button sets the machine for play mode, moving the tape at the selected speed. The button lights when in play or record mode, and it must also be pressed simultaneously with the Record button to initiate Record Mode.



This button sets the machine for record mode, provided the PLAY button is simultaneously pressed. The button lights when recording.

In order for individual tracks to actually record, the corresponding Mode Selector must be switched to one of the three Record *READY* positions. Refer to section 1.1.2 for details of the Mode Selector function.



This button stops the machine from any mode.

CAUTION: When the end of the tape runs off a reel, the LOAD button must be pressed. Pressing STOP under these circumstances will not stop the reel motors.



Shuts off all reel motors and drops the tape lifters when the button is pressed. Button is lit when in load mode. LOAD allows manually controlled tape motion by defeating the constant tension servo mechanism responsible for automatic slack takeup. It is useful for threading

tape and for editing. The machine will leave load mode when STOP or any motion button is subsequently depressed.

LOAD may be pressed simultaneously with another motion control. For example, pressing PLAY and LOAD permits precise cueing (play/load mode), and pressing PLAY, RECORD and LOAD permits spot-erasure (record/load mode).

NOTE: When spot erasure is complete, press the REWIND or FORWARD button to drop out of record without "clicks."

LOAD may be used when tape is not threaded but it is necessary to use the motion controls for alignment or check-out. Some motion may begin, but slight hand pressure on the reels will hold the tape stationary. A specific application of this function is to find out whether or not the machine is in PRE when switched to play mode; the desired PRE status may be selected without actually advancing the tape.

CAUTION: NEVER DEPRESS LOAD WITH A REEL OF TAPE THREADED AND MOVING. This removes the tape tension, and can cause uncontrolled spillage. LOAD should only be pressed when the reels are still, or when approaching 15' from the end of the tape.

1.1.2 SYNC PANEL Ready and Record indicators, a VU meter and a Mode Selector switch are mounted on the Sync Panel, one set per channel. The actual functions performed by these indicators and switches are somewhat complex, and are treated in greater detail elsewhere in section one. Below are listed brief descriptions of each item on the front of the Sync Panel.

ITEM	DESCRIPTION
VU METER	This reads the average signal level of the channel, either from the line input or the play amplifier output: the play amplifier derives its signal from either the record or the play head, depending upon the logic and switch functions (described elsewhere in section one). The meter is factory calibrated for 0 VU=+4 dBm (into 600 ohms).

READY Indicator (amber lens)	This lamp lights when the channel's Mode Selector switch is in any of the three Record positions, but the transport is not in record mode. The light is a signal that the channel will record as soon as the machine is placed in record mode.
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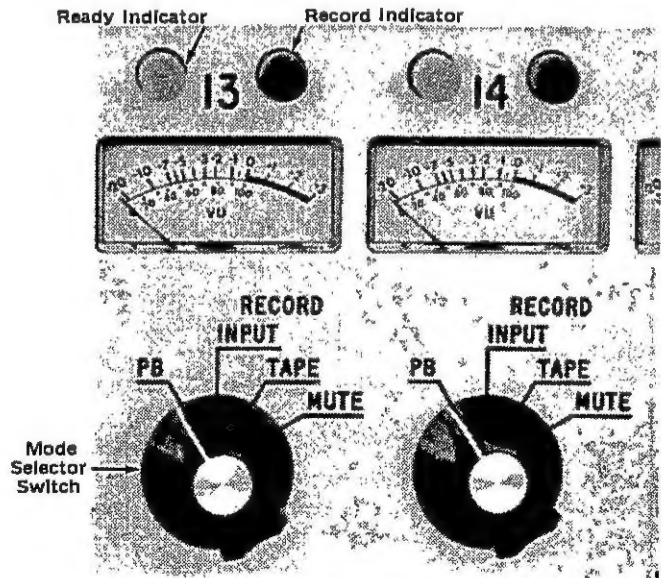
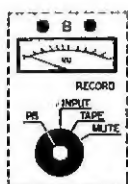


Figure 1-2. Sync Panel Controls & Indicators

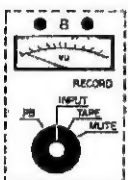
RECORD Indicator (red lens)	This lamp lights when the channel's Mode Selector switch is in any of the three Record positions and the transport is in record mode. The light is a warning that the channel is actually recording.
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MODE SELECTOR

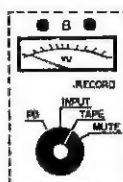
This switch determines the status of the record and playback electronics for the corresponding channel. There are four modes:



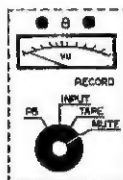
PB (Playback) This is the **SAFE** position from which the track cannot be erased or recorded. The channel output is derived from either the play or the record head, depending upon the sync status. The VU meter follows the channel output, whether derived from the record or play head.



RECORD/INPUT This is a **READY** mode from which the track may be recorded. The VU meter always follows the line input to the channel. The channel output is derived from the line input whenever PRE is lit, and from the play amplifier when PRE is off: the play amplifier signal is derived from the play head or record head, depending upon the sync status.



RECORD/TAPE This is a **READY** mode from which the track may be recorded. The VU meter and the channel output both follow the play amplifier output. The play amplifier output will always be from the play head unless the machine is in play/sync mode; then the output will be derived from the record head.



RECORD/MUTE This is a **READY** mode from which the track may be recorded. The VU meter always follows the line input to the channel. The channel output is muted (no output) whenever PRE is lit. Therefore, the only time when there is channel output is in play mode with PRE off. This output will be derived from the record head, or the play head, depending on the SYNC status.

1.2 PRE-OPERATING PROCEDURE

1.2.1 APPLY POWER Press the **POWER** button. This illuminates both the button and the VU meters, and prepares the machine for operation.



Selecting Scan speed (button lit) will advance the tape at 60ips in play or record modes. The equalization is not affected by the SCAN button.

1.2.2 SELECT TAPE SPEED The tape speed is determined in three ways. Each speed selector described below will override the previous one.



Select the desired play or record speed with this button. The speed is 30ips when the button is lit, and 15ips unlit. Electronic record/play equalization is automatically switched to conform to the selected tape speed.

The variable speed oscillator has a Locked/Variable speed switch. This switch does not affect the equalization. In Locked position (toggle switch up), the transport will play or record at the previously selected 15ips, 30ips or Scan speed. In Variable position (toggle switch down), the vernier dial may be adjusted to continuously vary the tape speed, to deviate $\pm 33\%$ from the selected speed.

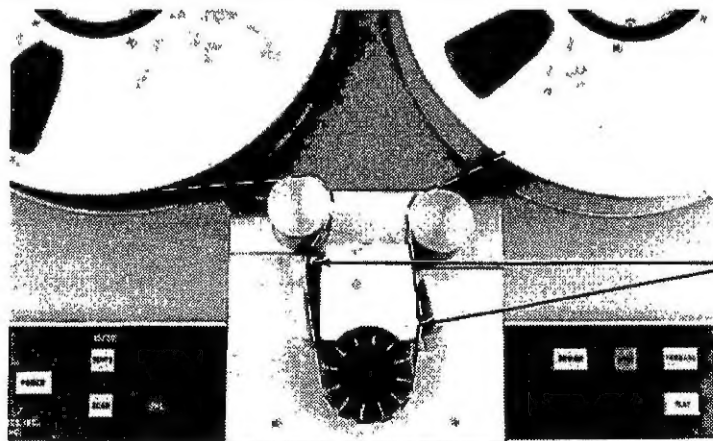


Figure 1-3.
Tape Threading Path

NOTE: Tape is routed outside lifters.

1.2.3 THREAD TAPE Only reels with NAB hubs, $4\frac{1}{2}$ " diameter (11.4cm) may be used. The supply and takeup reel sizes may be mixed since the transport servo mechanism automatically adjusts the motors to obtain the proper tape tension.

To facilitate threading, apply power and press the **LOAD**

button. This eliminates the braking force and also prevents runaway motion of the reels. Thread the tape as illustrated in figure 1-3, anchoring the end to the hub of the takeup reel. Hand-turn the takeup reel to remove most of the slack, and press the **STOP** button; **STOP** removes the machine from load mode and fully tensions the tape.

1.3 PLAYBACK

- Step 1** Set the Mode Selector of each channel to PB.
- Step 2** Apply power, select the desired speed, and thread the tape as described in section 1.2. Amber *READY* lights should not be lit.

Step 3 Press the PLAY button to initiate playback. The channel outputs and VU levels will be derived from the play head. The audio quality from SYNC is the same as normal play mode.

Step 4 Press the STOP button to end playback and stop tape motion.

NOTE: *If tape runs completely off the reel, press LOAD. Do not press STOP.*

1.4 FAST WINDING

1.4.1 FORWARD WINDING

- Step 1** Tape should be threaded, and power ON, as described in section 1.2.
- Step 2** Press the FORWARD button to initiate fast winding onto the takeup reel. This may be initiated from any mode.
- Step 3** Press the STOP button to end winding when the desired point is reached, unless the tape runs completely off a reel. In that case press the LOAD button.

1.4.2 REWINDING

- Step 1** Tape should be threaded, and power ON, as described in section 1.2.
- Step 2** Press the REWIND button to initiate fast winding onto the supply reel. This may be initiated from any mode.
- Step 3** Press the STOP button to end winding when the desired point is reached, unless the tape runs completely off a reel. In that case press the LOAD button.

1.5 RECORDING

NOTE: *Always bulk-erase any tape which was recorded on equipment with a different head configuration. This assures complete erasure.*

1.5.1 WITHOUT SYNC

- Step 1** Tape should be threaded with power ON, as described in section 1.2.
- Step 2** Set the Mode Selector switch for each channel. Channels to be recorded should be set to RECORD/INPUT, and the *READY* light will turn on. Channels not to be recorded should be set to PB.
- Step 3** Apply a test signal or sample program material to the input of all channels to be recorded. Adjust the input levels so that the corresponding VU meters indicate no more than 0 VU for most peaks.* Extreme peaks may indicate +2 or +3.
- Step 4** When ready to record, press the PLAY button and hold it down while pressing the RECORD button. All channels that were in *READY* will now record; the amber lights will turn off and the red lights will turn on.

NOTE: *The VU readings and audio output of the channel(s) recording are now derived from the line input. For*

monitoring the actual recorded signal, set the Mode Selector(s) to Record/Tape; the VU reading(s) and channel output(s) will now be derived from the play head.

- Step 5** Press the STOP button to end recording and stop the tape motion, unless the tape has run completely off the supply reel; in that case, press LOAD.

1.5.2 WITH SYNC The Sync feature allows recordings to be made in synchronization with previously recorded program material. In order to achieve the correct timing, all channel outputs are derived from the record head while the machine is in PLAY/SYNC mode. As soon as the RECORD button is pressed, placing the machine in RECORD/SYNC mode, the input to channels in RECORD replaces the record head output. For channels in PB, the record head output continues to feed the channel output, so that a performer or engineer may monitor the new recording in synchronization with the existing tracks.

- Step 1** With power ON, thread tape on the transport, as described in section 1.2.
- Step 2** Set the Mode Selector for each channel; channels to be recorded should be set to RECORD/INPUT. Previously recorded or unused channels should be protected by setting the Mode Selector to PB.

* 0 VU is factory calibrated to a level of +4 dBm.

Step 3 Depress the SYNC button. It should light, indicating the machine is ready to play and record in sync.

Step 4 Apply a test signal or sample program material to the input of those channels to be recorded. Adjust the input levels so that the corresponding VU meters show peaks of no more than 0 VU. Extreme peaks may indicate +2 or +3 VU.

NOTE: *During synchronized recording, some performers prefer to have their channel(s) muted. If the Mode Selector is placed in RECORD/MUTE, then the desired effect will be achieved; the channel will have no audio output while recording. The output during PLAY will be muted if PRE is lit, or will be derived from the record head if PRE is off.*

Step 5 Press the PLAY button. The output of all previously recorded channels may now be monitored, and at the instant recording is to begin, the PLAY and RECORD buttons may be depressed.

Step 6 By switching the Mode Selectors to RECORD/TAPE, the quality of the recorded signal may be monitored. This mode of monitoring is generally preferred, so long as the output from the channels is not fed to the performer; since there is a time delay, such monitoring could be disconcerting.

Step 7 Press the STOP button to end recording and halt the tape motion, unless the tape has run completely off the supply reel. In that case, press LOAD.

1.6 EDITING

The two edit modes available are PLAY/LOAD and PLAY/SCAN. The PLAY/LOAD mode should be entered only from STOP mode. It is used to precisely locate cues. IN PLAY/LOAD, the reel motors do not maintain tape tension, so the tape may be manually controlled. This also makes splicing easy, since slack is not automatically taken up. To leave PLAY/LOAD mode, press STOP or any other motion button.

PLAY/SCAN is helpful for rough location of program cues. Pressing the SCAN button sets the transport for a 60ips speed, although equalization remains at the 15ips or 30ips setting previously selected. When PLAY is then pressed, the machine will play at 60ips. SCAN may be punched in and out during the playback of a tape. To leave SCAN mode, press the SCAN button a second time.

NOTE: *RECORD/SCAN mode may be used, and recording will occur at the rate of 60ips. But equalization remains optimized for 15ips or 30ips. RECORD/LOAD mode may be used to achieve spot erasures, but care must be taken to assure that the erase head, not the record head, is aligned with the point where erasure is to begin. Press REWIND or FORWARD when erasure is complete to eliminate punch-out "clicks."*

SECTION TWO
ELECTRONIC ALIGNMENT AND
TAPE HANDLING ADJUSTMENT

2.1 ELECTRONIC ALIGNMENT

The record and playback electronics are aligned in a manner similar to other professional tape machines. The equalization curves fall within NAB specifications, although there is some deviation from the idealized NAB curve which enables Stephens' machines to record low frequencies at greater levels before reaching tape saturation. Nevertheless, standard NAB alignment tapes are used in the following procedures.

Stephens' heads are factory calibrated to the proper azimuth, zenith and meridian. Because the heads and transport top plates are precision machined, no further mechanical alignment is necessary.

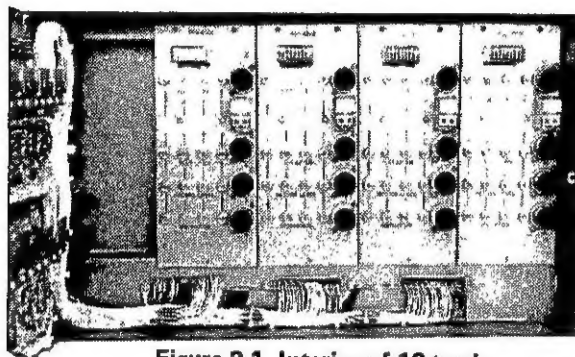


Figure 2-1. Interior of 16-track Sync Panel showing 811D-4000 Modules

2.1.1 PLAY LEVEL & EQUALIZATION

- Step 1** Degauss the heads in accordance with standard procedures. This is a conventional method for removing any residual magnetism from the heads, magnetism which may otherwise degrade the high frequencies on delicate alignment tapes, interfering with proper level calibration.
- Step 2** Turn power ON and press LOAD. Thread a standard NAB alignment tape for the appropriate speed on the transport. A Full-Track alignment tape is preferable.

NOTE: It is generally desirable to store alignment tapes with the tail end out. Therefore, the tape will be threaded from the right to the left, and rewound. This procedure assures evenly wound tape.

- Step 3** Set the transport speed to correspond with the alignment tape, 15ips or 30ips.
- Step 4** Set all sync panel Model Selectors to PB.
- Step 5** Undo the latch on the sync panel, and swing the panel open, revealing the 811D-4300 series modules. Refer to figure 2-1.

Figure 2-2. 811D-4000 Module

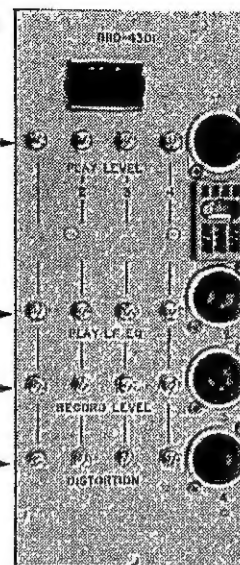
Play Level Trim
(Section 2.1.1)

Play LF EQ Trim
(Section 2.1.3)

Record Level Trim
(Section 2.1.1)

Distortion Trim

These controls, not provided on all models, are factory adjusted and should not be disturbed.



- Step 6** Press the PLAY button, and locate a 0 VU reference on the tape, preferably at 1000Hz.
- Step 7** Adjust the PLAY LEVEL of each channel (the trimmer on the top row of the 4300 module) so the corresponding VU meter indicates 0 dB. Refer to figure 2-2.
- Step 8** Press the STOP button.

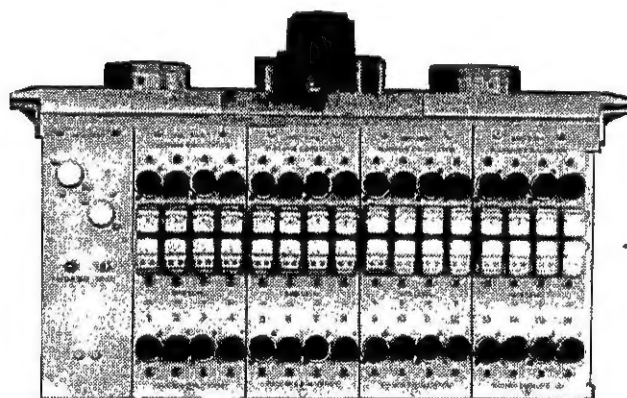
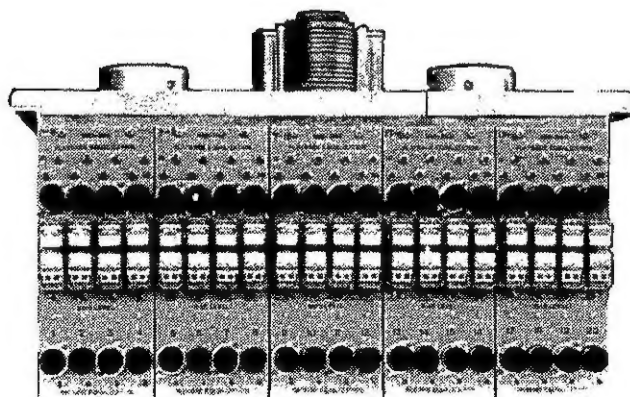


Figure 2-3. Front of Model 103 Transport 16-track (above) and 24-track (below)



- Step 9** Locate the 811D-3000 series modules at the front edge of the transport; cabinets have a door which swings down for access to these modules when the pair of buttons at the upper corners are depressed.

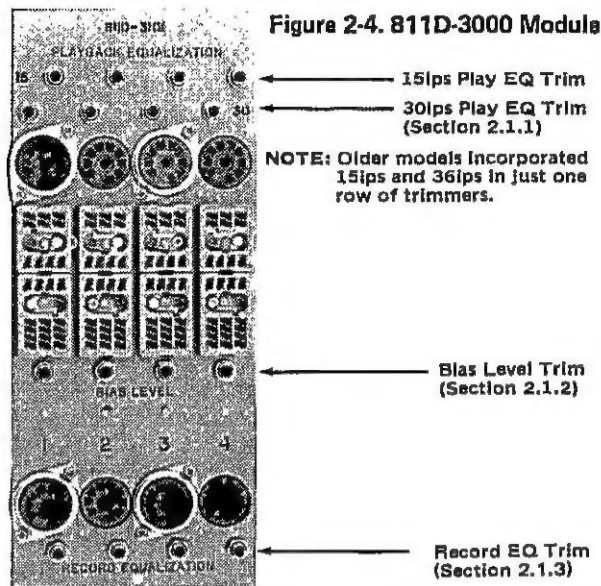


Figure 2-4. 811D-3000 Module

- Step 10** Place the machine in PLAY mode, and locate the 0 VU, 15 kHz reference on the tape.
- Step 11** Adjust each channel's PLAYBACK EQUALIZATION (trimmers located on the 811D-3000 series modules), so the corresponding VU meter indicates 0 dB. (Refer to fig. 2-4.)

NOTE: Adjust the trimmers corresponding to the tape speed; top row for 15ips and lower row for 30ips. Early models are equipped with just one set of trimmers, used for either play speed.

- Step 12** Press FORWARD, and wind the alignment tape to the end; then press LOAD and remove the tape from the transport.

This completes the playback alignment. All controls may be left as they are, with the 811D-3000 modules exposed, in preparation for the following procedures.

2.1.2 BIAS LEVEL & RECORD LEVEL The

front of the transport should be exposed, as described in 2.1.1, step 9. Power is ON.

- Step 1** Thread a blank tape on the transport (section 1.2.3).
- Step 2** Set all Mode Selectors to RECORD/TAPE.
- NOTE:** The procedures outlined in steps 3-7 are to be performed for each channel in succession.
- Step 3** Apply a 1000 Hz, +4 dBm sine wave to input.
- Step 4** Adjust the RECORD LEVEL trimmer (in the sync panel, see figure 2-2) to approximately mid rotation.

- Step 5** Press PLAY and RECORD, placing the machine in record mode.
- Step 6** Set the BIAS LEVEL trimmer (on the 811D-3000 module, see figure 2-4) by turning it clockwise until the corresponding VU meter reaches a peak, then continue to turn clockwise until the level drops 1/4 to 1/8 dB below the peak.
- Step 7** Readjust the RECORD LEVEL trimmer so that the VU meter indicates 0 dB.
- Step 8** Press STOP. This completes the record and bias level adjustments.

2.1.3 BIAS FREQUENCY & SYMMETRY

Trimmers for bias frequency and symmetry are located on the bias module, and are set at the factory for optimum performance. While the bias frequency does not affect the quality of the recorded signal, it does affect the efficiency of conversion of the electrical signal to the magnetic flux. The frequency is therefore factory set for maximum efficiency with the largest number of tracks in RECORD mode. The symmetry control, labeled NOISE, affects the waveform of the bias, and consequently the noise level of the unmodulated, recorded tape. The noise setting is not critical; however, if the optimum noise characteristic is desired, bias symmetry may be adjusted as follows:

- Step 1** The transport should be oriented so that the bias module is accessible. On machines of up to 16 tracks, the bias module is mounted on the front of the transport. 24 track or larger machines may have twin bias modules beneath the transport; one module is slaved to the other, so only one set of frequency & symmetry trimmers is provided.
- Step 2** Thread a blank tape on the transport (section 1.2.3), with power ON.

Step 3 To arrive at the optimum symmetry setting, first determine the number of tracks which are simultaneously placed in RECORD MODE. For example, a 24 track machine may be operated with just 8 tracks in record mode at any given time. Set this number of tracks in RECORD/TAPE position with the sync panel mode selector. The resulting load on the bias circuit is slight but it will enable the most accurate setting of the symmetry (noise) control.

Step 4 Monitor the output of any one of those tracks placed in RECORD; then place the transport in RECORD MODE by pressing the PLAY and RECORD buttons simultaneously.

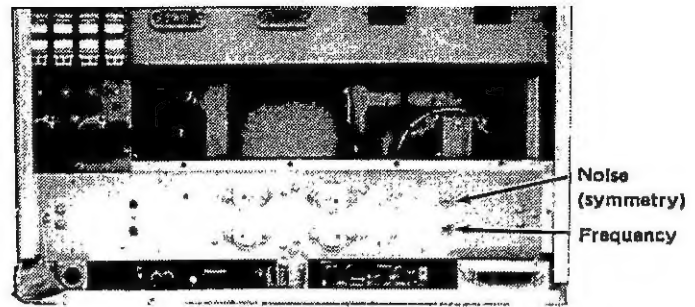


Figure 2-5. Bias Modules Beneath 24/40 Track Transport

Step 5 Adjust the NOISE trimmer for the minimum noise on the track being monitored (monitoring can be done with a voltmeter or by ear).

Step 6 Press STOP. This completes the symmetry adjustment.

2.1.4 RECORD EQ The 811D-3000 modules should be accessible, as described in section 2.1.1, step 9. A test oscillator should be available for connection to the input of each channel (or by means of input assignment through the mixing console).

Step 1 Turn the power ON, and thread a blank tape on the transport.

Step 2 Set all sync panel Mode Selectors to RECORD/TAPE.

Step 3 Press the PLAY and RECORD buttons, placing the machine in record mode.

NOTE: The procedures outlined in steps 4-7 are to be performed for each channel in succession.

Step 4 Apply a 15 kHz, +4 dBm sine wave to the input.

Step 5 Adjust the RECORD EQUALIZATION (trimmer located on the 811D-

3000 module, see figure 2-4) so the corresponding VU meter indicates 0 dB.

NOTE: Steps 6 and 7 are required only for 15ips alignment. For 30ips alignment, proceed with step 8.

Step 6 Change the input signal to a +4 dBm sine wave of between 35 and 40 Hz.

Step 7 Adjust the PLAY LF EQ (trimmer in the sync panel, see figure 2-2) so the corresponding VU meter indicates 0 dB.

Step 8 Press REWIND and when the tape runs off the takeup reel, press LOAD. This completes the recording equalization adjustments.

NOTE: It is considered a safe practice to reset all Mode Selectors to PB, unless recording is to be done immediately following the alignment procedure.

2.2 TAPE MOTION ADJUSTMENTS

The Stephens' transport is designed for gentle tape handling without need for mechanical adjustments. The servo-operated supply and takeup motors are controlled by circuitry which compares the actual tape motion with the desired motion. This is done by means of a tachometer and a discrimination circuit which integrates the measured tape speed with motion sensing inputs from each motor and with a synchronization signal from an internal clock or an external oscillator/resolver. Therefore, the only adjustments required are electrical in nature.

2.2.1 TAPE TENSION ADJUSTMENT

The following adjustment requires a voltmeter capable of accurately indicating 10 volts dc. The bottom of the transport must be accessible (see section 2.1.1, step 9).

Step 1 Connect a voltmeter across the 5-ohm resistor on the power supply. The meter should be set to the 10 Vdc scale (or higher), with the leads connected as shown in figure 2-6.

Step 2 Apply power to the transport and thread a reel of tape.

Step 3 Press the PLAY button, placing the transport in motion at 15ips or 30ips.

Step 4 Locate the tension trimmer on the SERVO CONTROL BOARD beneath the transport and adjust it for a reading of 10 volts across the power resistor (for 2" tape, 1" tape requires 7 volts). See figure 2-7.

- Step 5** Press the STOP button, and disconnect the voltmeter leads from the power resistor. This completes the tension adjustment.

Connect Voltmeter across
this resistor
Twisted lead (+)
Gray lead (-)

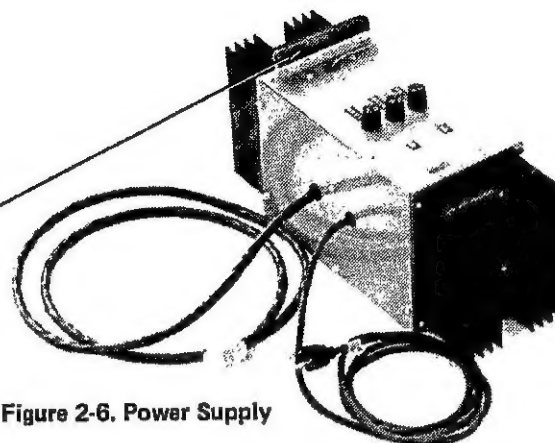


Figure 2-6. Power Supply

2.2.2 SLACK ADJUSTMENT The bottom of the transport must be accessible (see section 1.1.1, step 9).

- Step 1** With no tape threaded on the transport, turn the power ON and press the STOP button.
- Step 2** Locate the SLACK control on the SERVO CONTROL BOARD (refer to figure 2-7).
- Step 3** Adjust the SLACK trimmer in a clockwise direction until the supply motor does not move.
- Step 4** Then rotate the trimmer counterclockwise until the motor just begins to move; it may alternately start and stop. This is the correct setting for the SLACK trimmer.
- Step 5** Turn off the power. The adjustment is complete.

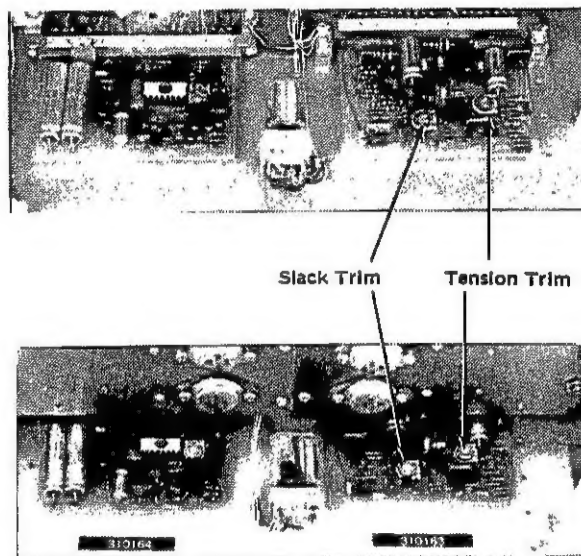


Figure 2-7. Servo and Resolver Boards
4 – 16-track (above) and 24 – 40-track (below)

2.2.3 SPEED ADJUSTMENT The fixed running speed of the transport may be precisely calibrated to 15ips, 30ips and 60ips by means of three independent trimmers. These trimmers are adjusted using the meter in the remote VSO unit. Three tachometer-triggered counter outputs in the transport provide approximately 60 Hz pulses for 15ips, 30ips and 60ips running speeds. When a given tape speed is precisely adjusted, the counter output will be exactly 60 Hz, corresponding to the sync signal. The sync signal is derived from the power mains or from an optional crystal/resolver input. At exact speed, the VSO meter will settle at mid-scale, rather than follow the beat of the out-of-phase signals.

The following adjustment may be done for one, two or all three tape speeds; speed trimmers for 15, 30 and 60ips are recessed beneath a cover plate, near the power button.

- Step 1** Turn the power ON, and thread a reel of tape.
- Step 2** Place the transport in PLAY mode, with the desired speed selected (i.e. 15ips, 30ips or SCAN).

- Step 3** Observe the VSO meter, with the VSO switched to fixed speed mode.

NOTE: The VSO meter should stabilize near mid-scale as the tape reaches full running speed. If there is a large rhythmic motion of the needle, then the speed must be adjusted. If the meter has a slight motion, but is near mid-scale, then adjustment is not necessary.

- Step 4** Remove the cover plate surrounding the POWER, PRE SCAN, SYNC and 30ips buttons. This may be done by inserting a screwdriver blade between the cabinet and the transport and prying up the cover.
- Step 5** Insert a screwdriver in the trimmer which corresponds to the speed selected. Adjust the trimmer gradually until the meter needle comes to rest at

mid-scale (see fig. 2-8). Due to temperature sensitivity, some upscale drift occurs if this adjustment is made when the machine has just been turned on. Therefore, it may be desirable to set the meter for a reading below mid-scale, allowing for the drift. Since the important factor is the stabilization of the needle, rather than the actual value on the scale, any stable setting from 0.3 to 0.7 is acceptable. The meter indicates phase lock rather than actual speed.

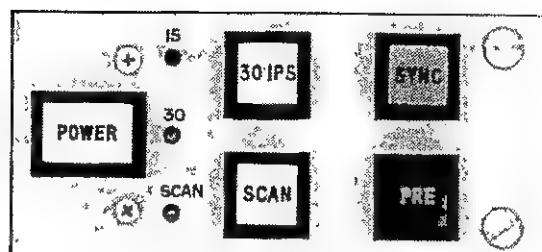


Figure 2-8. Speed Trimmers

- Step 6** Press STOP. If other speed calibration is required, repeat steps 2, 3 and 5 before replacing the cover plate.
- Step 7** Turn the power OFF and replace the cover plate.

Stephens Sync panel input-output (I/O) bule ribbon connectoroinformation:

(Amphenol 57-40500 chasis)
(Amphenol 57-30500 cable)

Note: 24 track and 16 track I/O connectors not interchangeable

connector 1 (SJ-15)

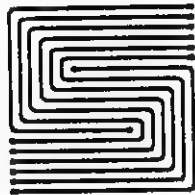
Pin	connection
1-12	Playback out 1-12 channel 1 out
13-24	Record in 13 is channel 1 in
25-37	Dolby (26 is chnallel 1)
38	Record
39-50	Grounds

connector 2 SJ-16 (same as above except as noted below:

Pin	Connection
38	(function not designated by factory)

16 track machine connections:

Pin	connection
10-25	grounds (buss together)
26-33	Dolby
34	Record
35-42	1-8 or 9-16 record input
43-50	1-8 or 9-16 playback output



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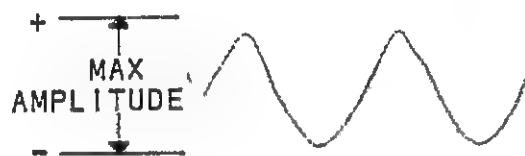
PHONE: (213) 842-5116

SENSOR ALIGNMENT

For the following procedure, the operator should be knowledgeable about the use of an oscilloscope. Be sure to ground the scope to the chassis of the machine before starting the alignment procedure.

1. Remove head shield carriers to get access to sensors.
2. Center SYM and 90 SYM pots.
3. Connect scope to TP 6, and set for .02 volts/div., Internal positive trigger.
4. Rotate BAL pot fully clockwise. With tape loaded, and deck in play mode, adjust Sensor 2 for maximum amplitude with minimum amplitude variation.

WARNING: Use extreme caution when adjusting sensors not to hit the encoded disk. Hitting the disk with a screwdriver or the inner surface of the sensor can cause permanent damage to the disk.



5. Rotate BAL pot fully counter clockwise. With the same above conditions, adjust Sensor 1 for maximum amplitude with minimum amplitude variation.

When completed, both sensor assemblies should be pointing toward the center of the drum shaft.

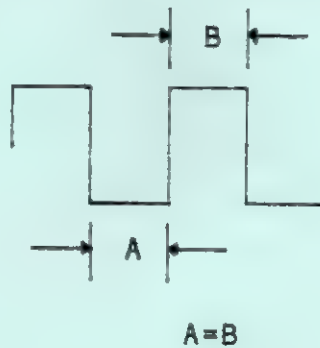
6. Center BAL pot. Rotate Sensor 1 and BAL pot for minimum amplitude on scope. Increase gain of scope for accuracy if necessary. Deck may run wild.

Do not readjust BAL pot for the rest of the alignment procedures.

7. Rotate Sensor 1 slightly for maximum amplitude with minimum amplitude variations.

This completes alignment of Sensors 1, 2 and the BAL pot.

8. Connect scope to TP 7. With deck in play mode adjust scope for display of square wave. Adjust SYM pot for symmetry of the square wave.



9. Connect scope to TP 5. Adjust scope for positive trigger. Reduce gain and adjust sweep for a display of four pulses. The first pulse should be at the start of the trace. Pulses two and three should be closely spaced together at the center of the screen with the fourth pulse at the far right side.



Adjust SYM pot so that pulse two is aligned on top of pulse three. This completes alignment of the SYM pot.

10. Connect scope to TP 1. With deck in play mode, adjust scope to display waveform. Adjust Sensor 3 for maximum amplitude with minimum amplitude variation. Adjust 90 SYM pot for symmetry of waveform.



11. Connect external trigger of scope to TP 2. With deck in play mode, switch scope to external positive trigger. Adjust trigger for a stable pattern.

12. Rotate Sensor 3 so that the scope trace starts with half of the positive portion of the square wave.

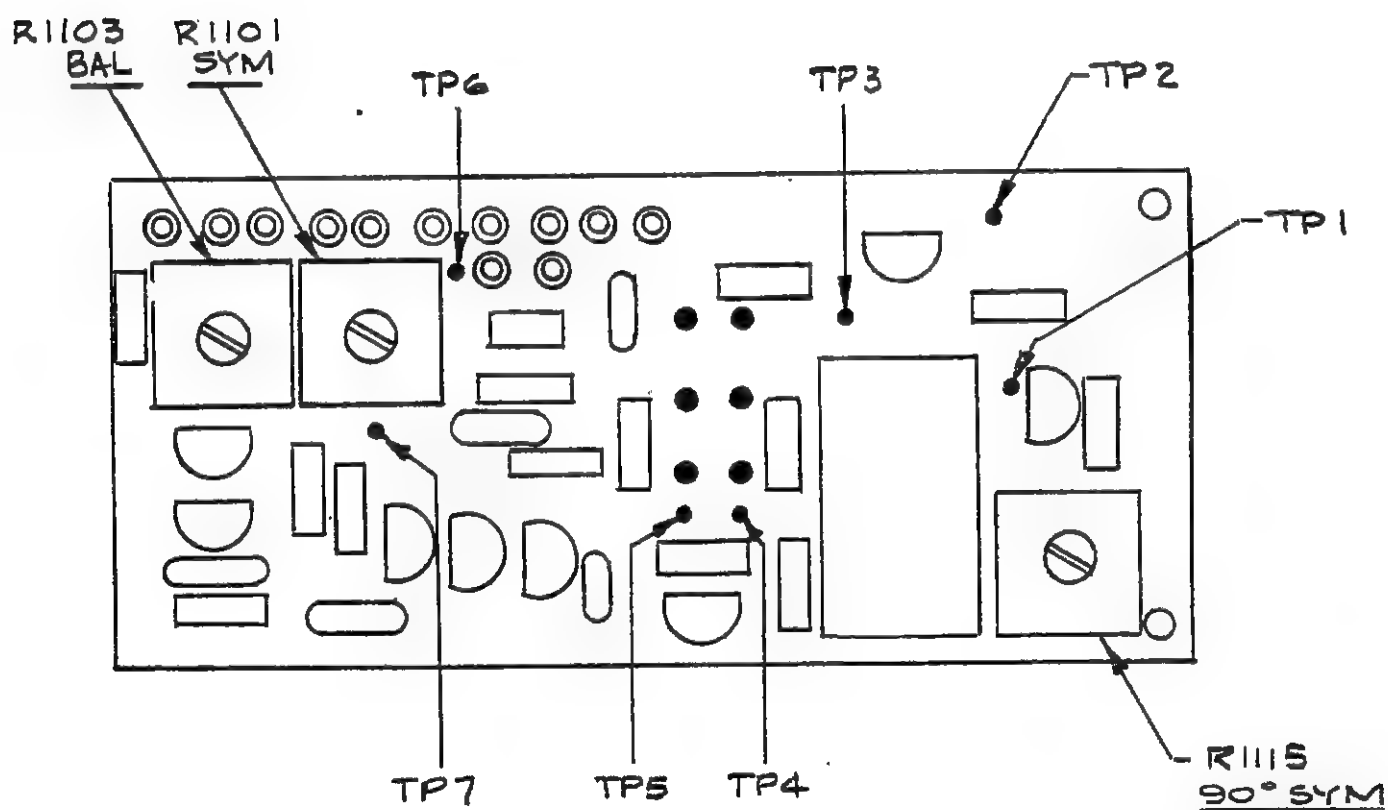
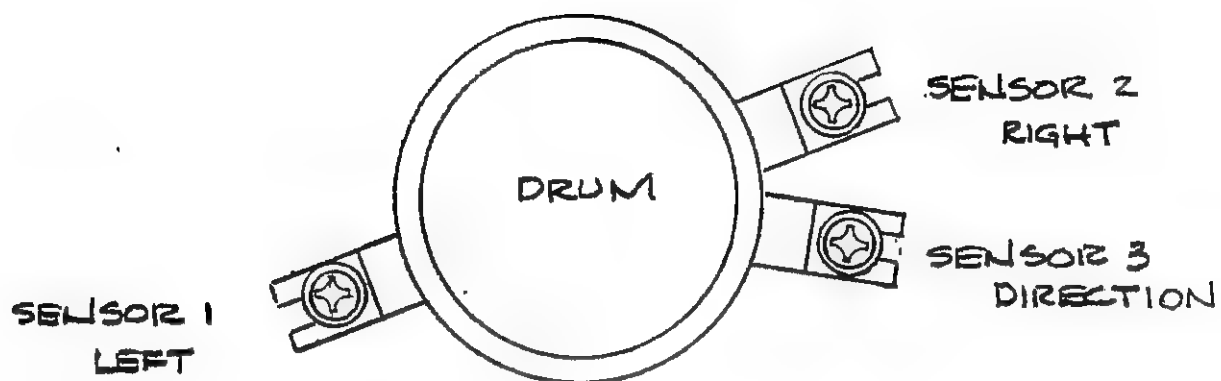


13. Run deck in rewind mode. The left side of the scope trace should now start with the negative portion of the square wave. If the slope of the square wave shows at the start of the trace, readjust Sensor 3. For better clarity of waveform, increase scope sweep speed.

14. Run deck in fast forward mode. Trace should start with the positive portion of the square wave during acceleration and deceleration. If the slope of the square wave shows at the start of the trace, readjust Sensor 3.

Sensor alignment is complete when, with deck operating at any shuttle speed in either direction, scope trace starts with no slope showing.

11-17-79 JFS



MRBS

Audities.org

~~MRBS~~

Stevens Test 01 7/23/14

Rewind Works

↳ Stop works but right reel strays
Play & Fast forward engage but no spinning tape

Transistors in power supply → motors

(Q16 & Q22) 2 separate - NTE 180/892F

2 together = P312/ECG 180/185/9547

(check first) Shotgun test transport switch transistors
(Dynamic control) (elo switches)

↳ Transistors on switches =

TI ~~1802~~ (TIC 44)
7322

ECG 5401

NTE180 (PNP) & NTE181 (NPN) Silicon Power Transistor High Power Audio Amplifier

Description:

The NTE180 (PNP) and NTE181 (NPN) are silicon complementary transistors in a TO3 type case designed for use as output devices in complementary audio amplifiers to 100 watts music power per channel.

Features:

- High DC Current Gain: $h_{FE} = 25 - 100$ @ $I_C = 7.5A$
- Excellent Safe Operating Area

Absolute Maximum Ratings:

Collector-Emitter Voltage, V_{CER}	100V
Collector-Base Voltage, V_{CB}	100V
Collector-Emitter Voltage, V_{CEO}	90V
Emitter-Base Voltage, V_{EB}	4V
Collector Current, I_C	30A
Base Current, I_B	7.5A
Total Device Dissipation ($T_C = +25^\circ C$), P_D	200W
Derate Above $25^\circ C$	1.14W/ $^\circ C$
Operating Junction Temperature Range, T_J	-65° to $+200^\circ C$
Storage Temperature Range, T_{stg}	-65° to $+200^\circ C$
Thermal Resistance, Junction-to-Case, R_{thJC}	0.875 $^\circ C/W$

Electrical Characteristics: ($T_C = +25^\circ C$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector-Emitter Breakdown Voltage	$V_{(BR)CER}$	$I_C = 200mA$, $R_{BE} = 100\Omega$, Note 1	100	—	—	V
Collector-Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 200mA$, Note 1	90	—	—	V
Collector-Base Cutoff Current	I_{CBO}	$V_{CB} = 100V$, $I_E = 0$	—	—	1.0	mA
		$V_{CB} = 100V$, $I_E = 0$, $T_C = +150^\circ C$	—	—	5.0	mA
Emitter-Base Cutoff Current	I_{EBO}	$V_{BE} = 4V$, $I_C = 0$	—	—	1.0	mA

Note 1. Pulse Test: Pulse Width $\leq 300\mu s$. Duty Cycle $\leq 2\%$.

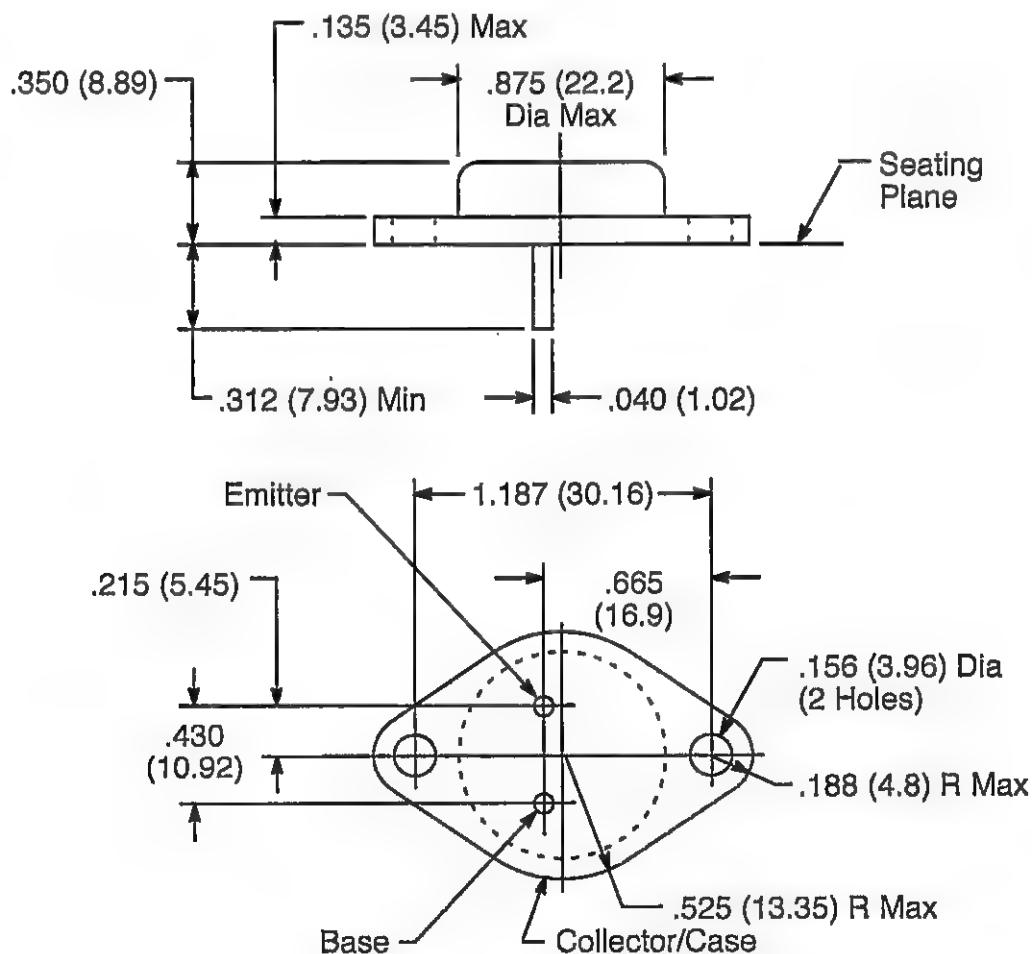
Electrical Characteristics (Cont'd): ($T_C = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
ON Characteristics (Note 1)						
DC Current Gain	h_{FE}	$I_C = 7.5\text{A}$, $V_{CE} = 2\text{V}$	25	—	100	
Base-Emitter ON Voltage	$V_{BE(on)}$	$I_C = 7.5\text{A}$, $V_{CE} = 2\text{V}$	—	—	1.3	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 7.5\text{A}$, $I_B = 750\text{mA}$	—	—	0.8	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 7.5\text{A}$, $I_B = 750\text{mA}$	—	—	1.3	V
Dynamic Characteristics						
Current Gain-Bandwidth Product	f_T	$I_C = 1\text{A}$, $V_{CE} = 10\text{V}$, $f = 1\text{MHz}$	2.0	—	—	MHz

Note 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$. Duty Cycle $\leq 2\%$.

Note 2. NTE181MP is a matched pair of NTE181 with their DC Current Gain (h_{FE}) matched to within 10% of each other.

Note 3. NTE180MCP is a matched complementary pair containing 1 each of NTE180 (PNP) and NTE181 (NPN).



TYPES TIC44, TIC45, TIC46, TIC47

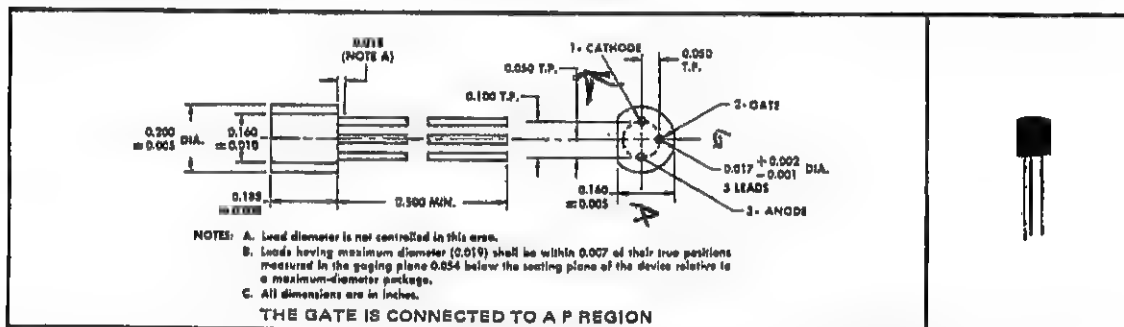
P-N-P-N PLANAR SILICON REVERSE-BLOCKING TRIODE THYRISTORS

SELECT† THYRISTORS‡
600 mA DC • 30 thru 200 VOLTS

Rugged, One-Piece Construction with Standard TO-18 100-mil Pin-Circle Configuration

Mechanical Data

These thyristors are encapsulated in a plastic compound specifically designed for this purpose, using a highly mechanized process developed by Texas Instruments. The case will withstand soldering temperatures without deformation. These devices exhibit stable characteristics under high-humidity conditions and are capable of meeting MIL-STD-202C method 106B. The thyristors are insensitive to light.



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

	TIC44	TIC45	TIC46	TIC47	UNIT
Static Off-State Voltage, V_D (See Note 1)	30	60	100	200	V
Repetitive Peak Off-State Voltage, V_{DRM} (See Note 1)	30	60	100	200	V
Static Reverse Voltage, V_R (See Note 1)	30	60	100	200	V
Repetitive Peak Reverse Voltage, V_{RRM} (See Note 1)	30	60	100	200	V
Continuous or RMS On-State Current at (or below) 55°C Case Temperature (See Note 2)	600				mA
Continuous or RMS On-State Current at (or below) 25°C Free-Air Temperature (See Note 3)	300				mA
Average On-State Current (180° Conduction Angle) at (or below) 55°C Case Temperature (See Note 4)	150				mA
Surge On-State Current (See Note 5)	6				A
Peak Negative Gate Voltage	8				V
Peak Positive Gate Current (Pulse Width < 300 μ s)	1				A
Peak Gate Power Dissipation (Pulse Width < 300 μ s)	4				W
Operating Free-Air Temperature Range	-55 to 125				°C
Storage Temperature Range	-55 to 150				°C
Lead Temperature 1/16 Inch from Case for 10 Seconds	260				°C

- NOTES: 1. These values apply when the gate-cathode resistance $R_{GK} \leq 1 \text{ k}\Omega$.
 2. These values apply for continuous d-c operation with resistive load. Above 55°C derate according to Figure 5.
 3. These values apply for continuous d-c operation with resistive load. Above 25°C derate according to Figure 6.
 4. This value may be applied continuously under single-phase, 60-Hz, half-sine-wave operation with resistive load. Above 55°C derate according to Figure 5.
 5. This value applies for one 60-Hz half sine wave when the device is operating at (or below) rated values of peak reverse voltage and on-state current. Surge may be repeated after the device has returned to original thermal equilibrium.

†Trademark of Texas Instruments

‡U. S. Patent No. 3,439,238

TYPES TIC44, TIC45, TIC46, TIC47 **P-N-P-N PLANAR SILICON REVERSE-BLOCKING TRIODE THYRISTORS**

electrical characteristics at 25°C free-air temperature (unless otherwise noted)

PARAMETER	TEST CONDITIONS	MIN	MAX	UNIT
I_D Static Off-State Current	$V_D = \text{Rated } V_D, R_{GK} = 1 \text{ k}\Omega, T_A = 125^\circ\text{C}$	50		μA
I_R Static Reverse Current	$V_R = \text{Rated } V_R, R_{GK} = 1 \text{ k}\Omega, T_A = 125^\circ\text{C}$	50		μA
I_{GT} Gate Trigger Current (See Note 6)	$V_{AA} = 6 \text{ V}, R_L = 100 \Omega, t_{p(g)} > 20 \mu\text{s}$	200		μA
V_{GT} Gate Trigger Voltage (See Note 6)	$V_{AA} = 6 \text{ V}, R_L = 100 \Omega, t_{p(g)} > 20 \mu\text{s}$	0.8		V
	$V_{AA} = 8 \text{ V}, R_L = 100 \Omega, t_{p(g)} > 20 \mu\text{s}, T_A = 125^\circ\text{C}$	0.2		
I_H Holding Current	$R_L = 100 \Omega, R_{GK} = 1 \text{ k}\Omega$	5		mA
V_T On-State Voltage	$I_T = 300 \text{ mA}, R_{GK} \geq 1 \text{ k}\Omega, \text{ See Note 7}$	1.4		V

NOTES: 6. When measuring these parameters, a 1-k Ω resistor should be used between gate and cathode to prevent triggering by random noise.

7. This parameter is measured using pulse techniques. $t_W = 1 \text{ ms}$, duty cycle $\leq 1\%$.

switching characteristics at 25°C free-air temperature

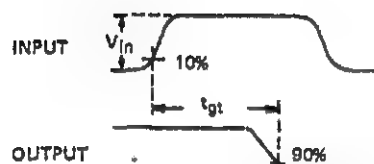
PARAMETER	TEST CONDITIONS	TYP	UNIT
t_{gt} Gate-Controlled Turn-On Time	$V_{AA} = 30 \text{ V}, R_L = 50 \Omega, R_G = 20 \text{ k}\Omega, V_{in} = 20 \text{ V}, \text{ See Figure 1}$	3.5	μs
t_q Circuit-Commutated Turn-Off Time	$V_{AA} = 30 \text{ V}, R_L = 50 \Omega, I_{RM} = 1 \text{ A}, \text{ See Figure 2}$	6.8	μs

thermal characteristics

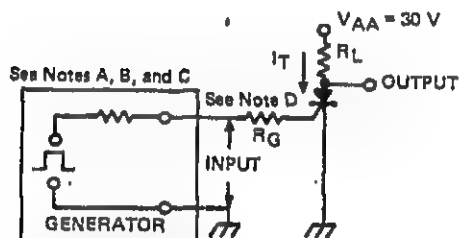
PARAMETER	MAX	UNIT
$R_{\theta JC}$ Junction-to-Case Thermal Resistance	75	$^\circ\text{C/W}$
$R_{\theta JA}$ Junction-to-Free-Air Thermal Resistance	275	

TYPES TIC44, TIC45, TIC46, TIC47 **P-N-P-N PLANAR SILICON REVERSE-BLOCKING TRIODE THYRISTORS**

PARAMETER MEASUREMENT INFORMATION



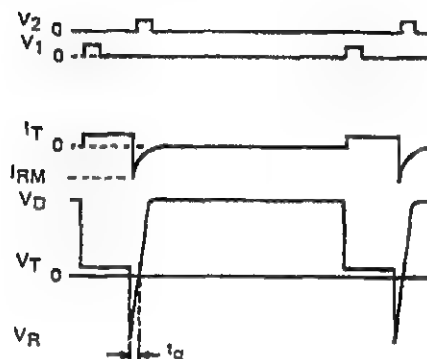
VOLTAGE WAVEFORMS



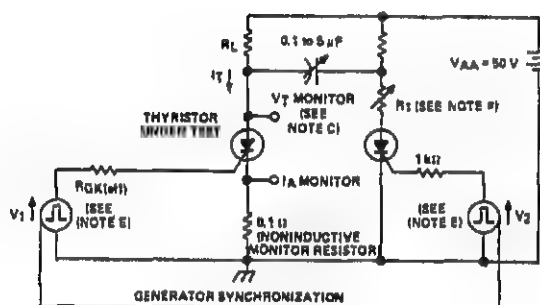
TEST CIRCUIT

FIGURE 1—TURN-ON TIME

- NOTES:** A. V_{in} is measured with gate and cathode terminals connected as shown and anode terminal open.
 B. The input waveform of Figure 1 has the following characteristics: $t_r \leq 40$ ns, $t_w \geq 20$ μ s.
 C. Waveforms are monitored on an oscilloscope with the following characteristics: $t_r \leq 14$ ns, $R_{in} \geq 10$ M Ω , $C_{in} \leq 12$ pF.
 D. R_G includes the total resistance of the generator and the external resistor.



WAVEFORMS



TEST CIRCUIT

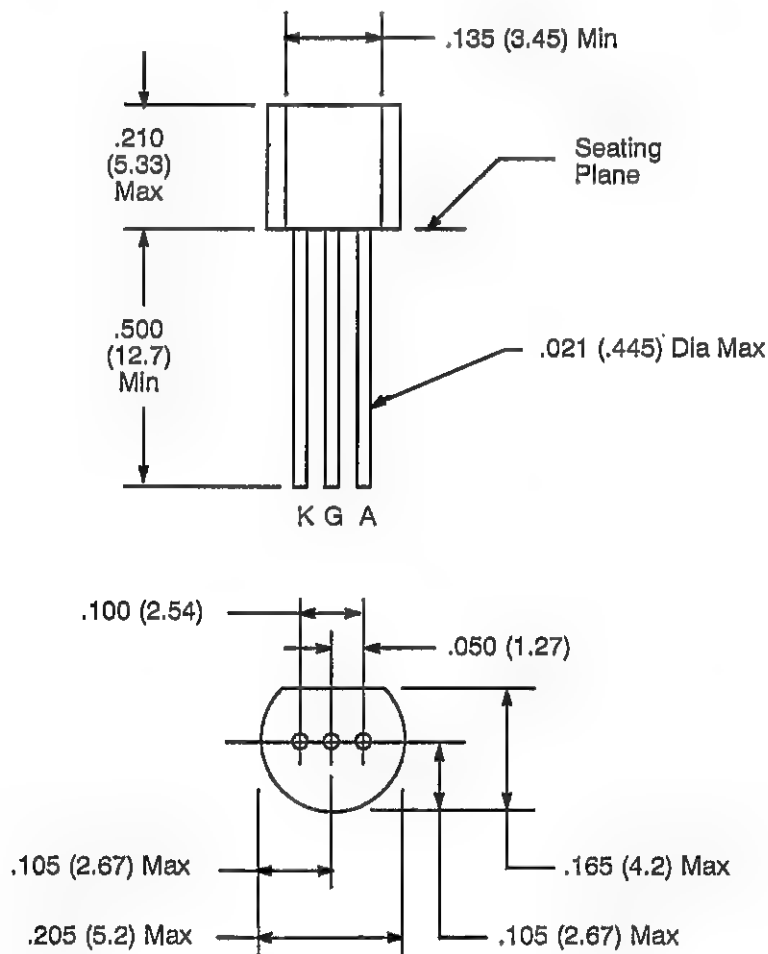
FIGURE 2—COMMUTATING TURN-OFF TIME

- NOTES:** E. Pulse generators for V_1 and V_2 are synchronized to provide an anode current waveform with the following characteristics: $t_w = 50$ to 300 μ s, duty cycle = 1%. The pulse widths of V_1 and V_2 are ≥ 10 μ s.
 F. Resistor R_1 is adjusted for $I_{RM} = 1$ A.

Electrical Characteristics:

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Peak Off-State Current	I_{RRM}	$V_{RRM} = \text{Max}, V_{DRXM} = \text{Max},$ $T_C = +100^\circ\text{C}, R_{G-K} = 1\text{k}\Omega$	—	—	50	μA
	I_{DRXM}		—	—	50	μA
Maximum On-State Voltage	V_{TM}	$T_C = +25^\circ\text{C}, I_T = 1.2\text{A (Peak)}$	—	—	1.7	V
DC Holding Current	I_{HOLD}	$T_C = +25^\circ\text{C}$	—	—	5	mA
DC Gate-Trigger Current	I_{GT}	$V_D = 6\text{VDC}, R_L = 100\Omega, T_C = +25^\circ\text{C}$	—	50	200	μA
DC Gate-Trigger Voltage	V_{GT}	$V_D = 6\text{VDC}, R_L = 100\Omega, T_C = +25^\circ\text{C}$	—	—	0.8	V
I^2t for Fusing Reference	I^2t	$> 1.5\text{msoc}$	—	—	0.15	A^2sec
Critical Rate of Applied Forward Voltage	dv/dt (critical)	$T_C = +100^\circ\text{C}$	—	5	—	$\text{V}/\mu\text{s}$

Anode
Gate
Cathode





ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748-5089
<http://www.nteinc.com>

NTE5400 thru NTE5406 Silicon Controlled Rectifier (SCR) 0.8 Amp Sensitive Gate, TO92

Description:

The NTE5400 through NTE5406 sensitive gate SCR semiconductors are halfwave unidirectional gate controlled rectifiers (SCR-thyristor) rated at 0.8 amps RMS maximum on-state current, with rated voltages up to 600 volts.

These devices feature 200 microamp gate sensitivity, 5 millamp holding current and 8 amp surge capabilities.

Available in a TO92 plastic package, these devices feature excellent environmental stress and temperature cycling characteristics and, coupled with their small size and electrical performance, lend themselves to various types of control functions encountered with sensors, motors, lamps, relays, counters, triggers, etc.

Absolute Maximum Ratings:

Repetitive Peak Reverse Voltage ($T_C = +100^\circ\text{C}$), V_{RRM}

NTE5400	30V
NTE5401	60V
NTE5402	100V
NTE5403	150V
NTE5404	200V
NTE5405	400V
NTE5406	600V

Repetitive Peak Off-State Voltage ($T_C = +100^\circ\text{C}$), V_{DRXM}

NTE5400	30V
NTE5401	60V
NTE5402	100V
NTE5403	150V
NTE5404	200V
NTE5405	400V
NTE5406	600V

RMS On-State Current, $I_{T(RMS)}$ 0.8A

Peak Surge (Non-Repetitive) On-State Current (One Cycle at 50 or 60Hz), I_{TSM} 8A

Peak Gate-Trigger Current ($3\mu\text{s}$ Max), I_{GTM} 500mA

Peak Gate-Power Dissipation ($I_{GT} \leq I_{GTM}$ for $3\mu\text{s}$ Max), P_{GM} 20W

Average Gate Power Dissipation, $P_{G(AV)}$ 200mW

Operating Temperature Range, T_{opr} -40° to $+100^\circ\text{C}$

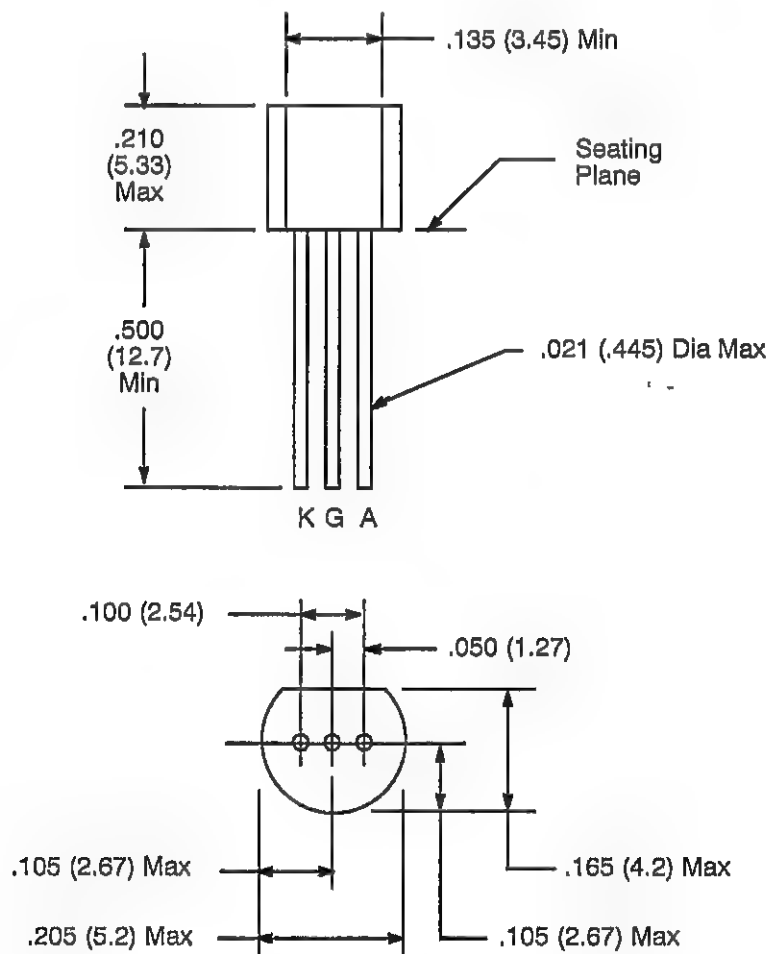
Storage Temperature Range, T_{stg} -40° to $+150^\circ\text{C}$

Typical Thermal Resistance, Junction-to-Case, R_{thJC} $+5^\circ\text{C/W}$

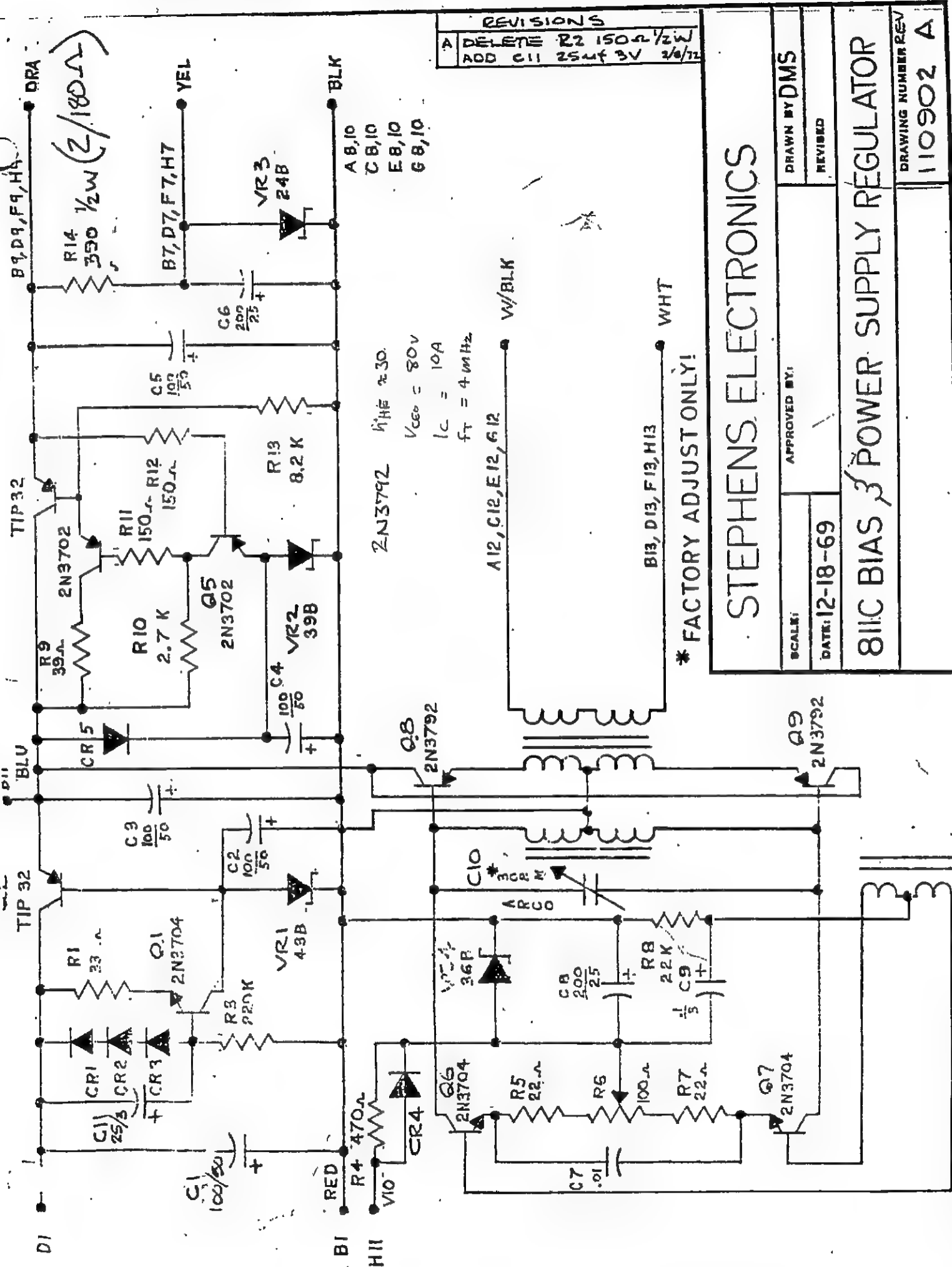
Typical Thermal Resistance, Junction-to-Ambient, R_{thJA} $+200^\circ\text{C/W}$

Electrical Characteristics:

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Peak Off-State Current	I_{RRM}	$V_{RRM} = \text{Max}, V_{DRXM} = \text{Max},$ $T_C = +100^\circ\text{C}, R_{G-K} = 1\text{k}\Omega$	—	—	50	μA
	I_{DRXM}		—	—	50	μA
Maximum On-State Voltage	V_{TM}	$T_C = +25^\circ\text{C}, I_T = 1.2\text{A (Peak)}$	—	—	1.7	V
DC Holding Current	I_{HOLD}	$T_C = +25^\circ\text{C}$	—	—	5	mA
DC Gate-Trigger Current	I_{GT}	$V_D = 6\text{VDC}, R_L = 100\Omega, T_C = +25^\circ\text{C}$	—	50	200	μA
DC Gate-Trigger Voltage	V_{GT}	$V_D = 6\text{VDC}, R_L = 100\Omega, T_C = +25^\circ\text{C}$	—	—	0.8	V
I^2t for Fusing Reference	I^2t	$> 1.5\text{msoc}$	—	—	0.15	A^2sec
Critical Rate of Applied Forward Voltage	dv/dt (critical)	$T_C = +100^\circ\text{C}$	—	5	—	$\text{V}/\mu\text{s}$



3948



PLAY DELAY SW

TO SEL SYNC SWITCH FOR OUT PGM SELECT

B5, D7, E8, H7

PLAY INPUT

A6, C6, E6, H5
CH. 4/8 3/4 2/6 1/5

TO REC AMP

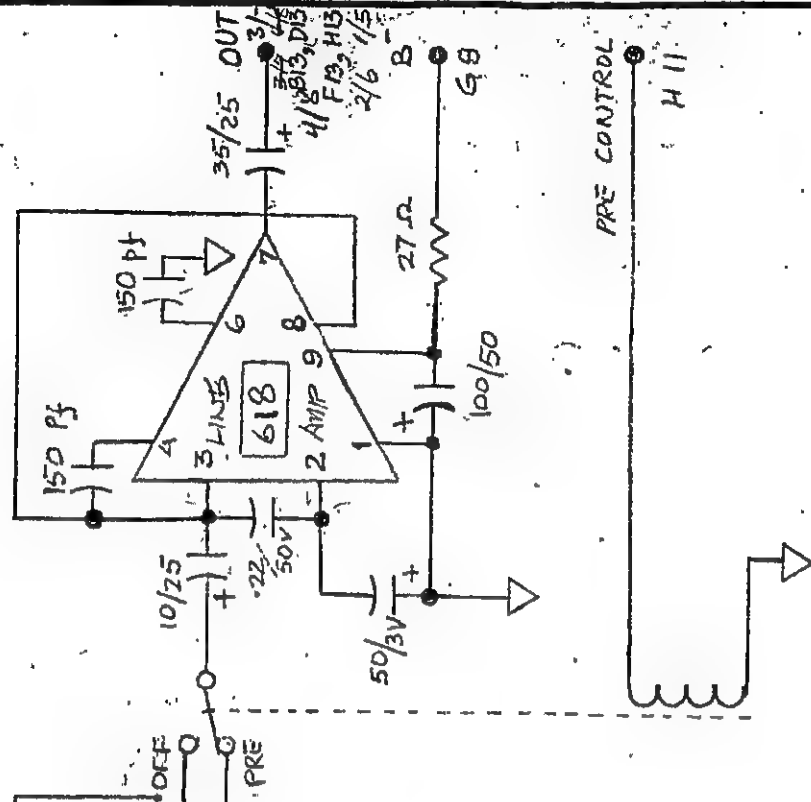
A2, C2, D3, G2
4/8 3/4 2/6 1/5

REC INPUT

B1, D1, H1, E2
CH. 4/8 3/4 1/5 2/6

30 TPS CONTROL IN

G12



PLAY L.F. EQ

20F

DISTORTION TRIM

REC LEVEL

10K CW

5K CCW

8.2K

4.7K

10/50

005

30TPS

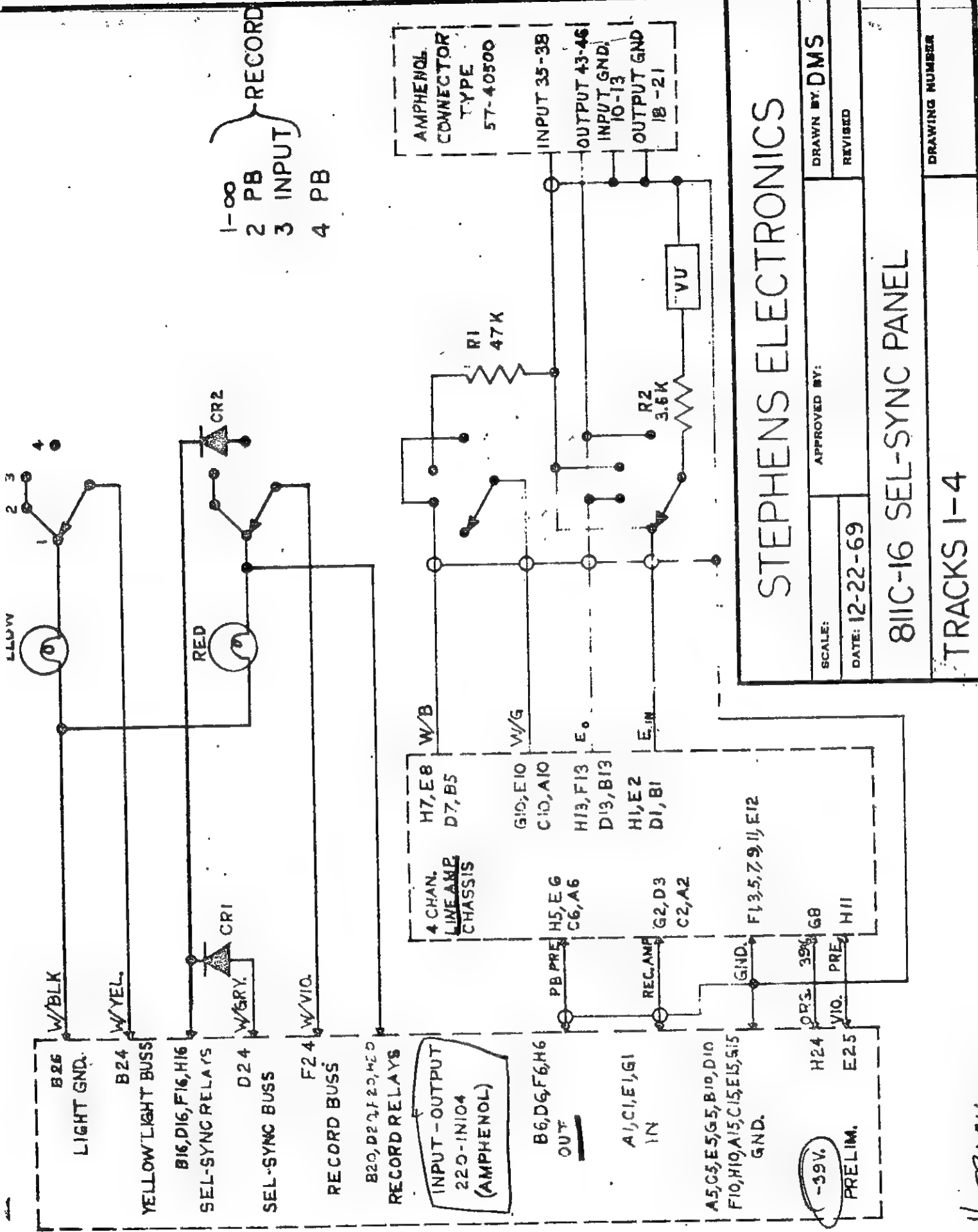
20F

- NOTES
1. BOTH RELAYS ARE ENERGISED
 2. RELAYS ARE COMMON TO ALL CHANNELS
 3. PIN NUMBERS ARE FOR GREEN AMPHENOL CONNECTORS
- A. ALL RESISTOR VALUES ARE 1/4 WATT

VERIFIED CORRECT BY LGF

STEPHENS ELECTRONICS INC

SCALE	APPROVED BY	DRAWN BY
DATE 5-30-75		Lally
REVISED		
4300 LINE AMPLIFIER CARD		
FOR 811-P ELECTRONICS		
DRAWING NUMBER		
110932-A		



STEPHENS ELECTRONICS

SCALE:	APPROVED BY:	DRAWN BY: DMS
DATE: 12-22-69	REVISED:	
8IIC-16 SEL-SYNC PANEL		
TRACKS 1-4		
DRAWING NUMBER		

16 TRACK

6-18

ONE OF FOUR CIRCUITS ON CARD.
RELAY COIL COMMON TO ALL FOUR CIRCUITS.

ONE OF FOUR CIRCUITS ON CARD.
RELAY COIL COMMON TO ALL FOUR CIRCUITS.

STEPHENS ELECTRONICS

SALE.

APPROVED BY:

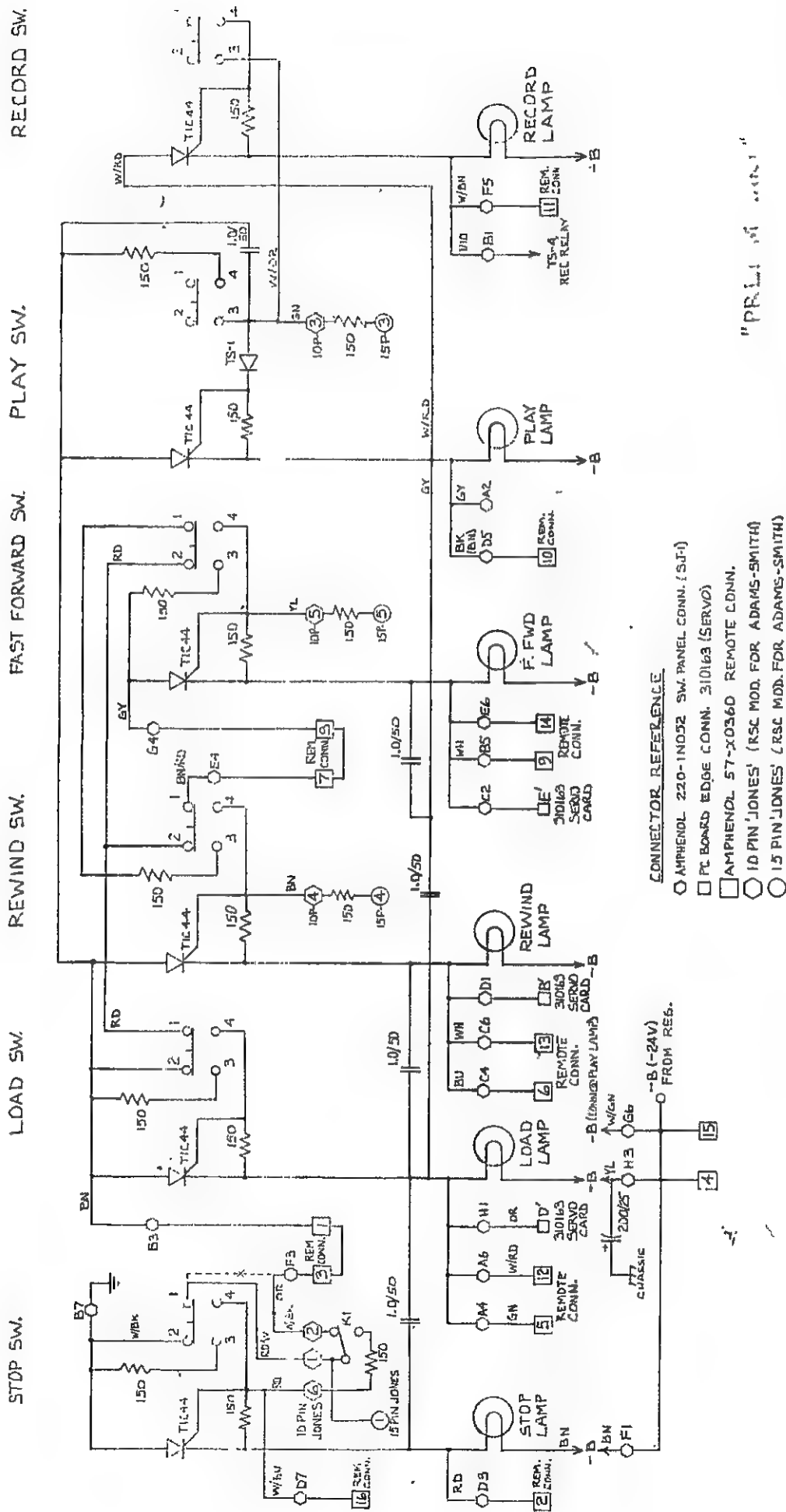
DRAWN BY DMS

DATE 12-23-69

QJ81A3H

21C LNT AMPLIFIER

CRAWFORD MURPHY



NOTE: USES RSC (RESISTOR-SER-CAPACITOR) LOGIC.

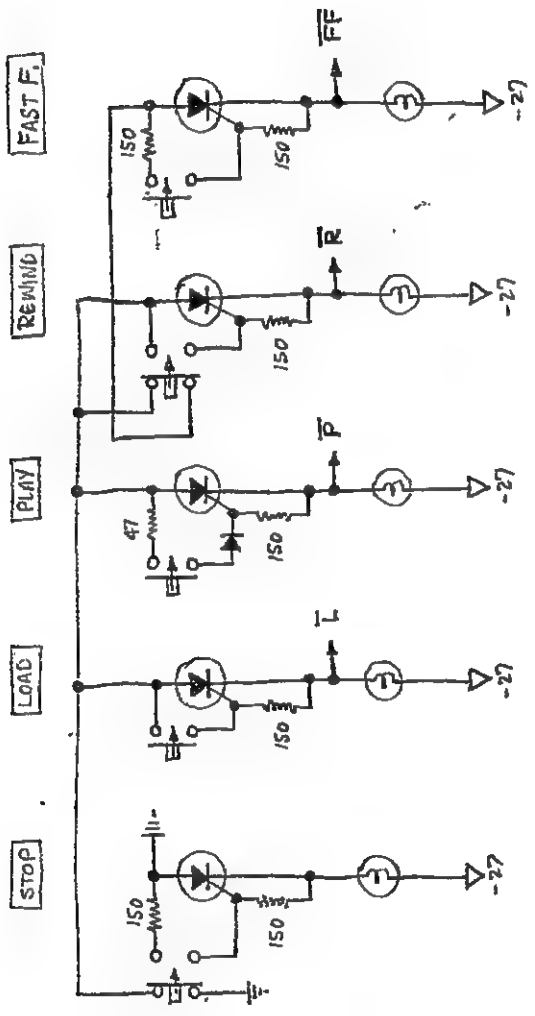
EB, VAN IE

STEPHENS TRANSPORT CONT'L: DETAIL SCHEMATIC DIAGS.
SUPPLEMENT TO TAPE TRANSPORT SCHEMATIC

CONNECTOR REFERENCE

- ☐ APPEND 220-1N052 SW. PANEL CONN. (SJT-I)
- ☐ PC BOARD EDGE CONN. 310163 (SERVO)
- ☐ APPEND 57-X0360 REMOTE CONN.
- ☐ 10 PIN 'JONES' (KSC MOD. FOR ADAMS-SMITH)
- ☐ 15 PIN 'JONES' (RSC MOD. FOR ADAMS-SMITH)

* COMMUTATING CAPS NOT SHOWN



42-382 10 SHEETS 8 SQUARE
42-382 10 SHEETS 5 SQUARE
42-382 200 SHEETS 5 SQUARE
NATIONAL



STEPHENS ELECTRONICS, INC

technical manual

Alignment Controls
Tape Speed Controls
See inside back cover.

PROFESSIONAL AUDIO
RECORDER/REPRODUCERS

STEPHENS ELECTRONICS, INC.
3513 Pacific Avenue, Burbank, Calif. 91505 Phone (213) 842-5116

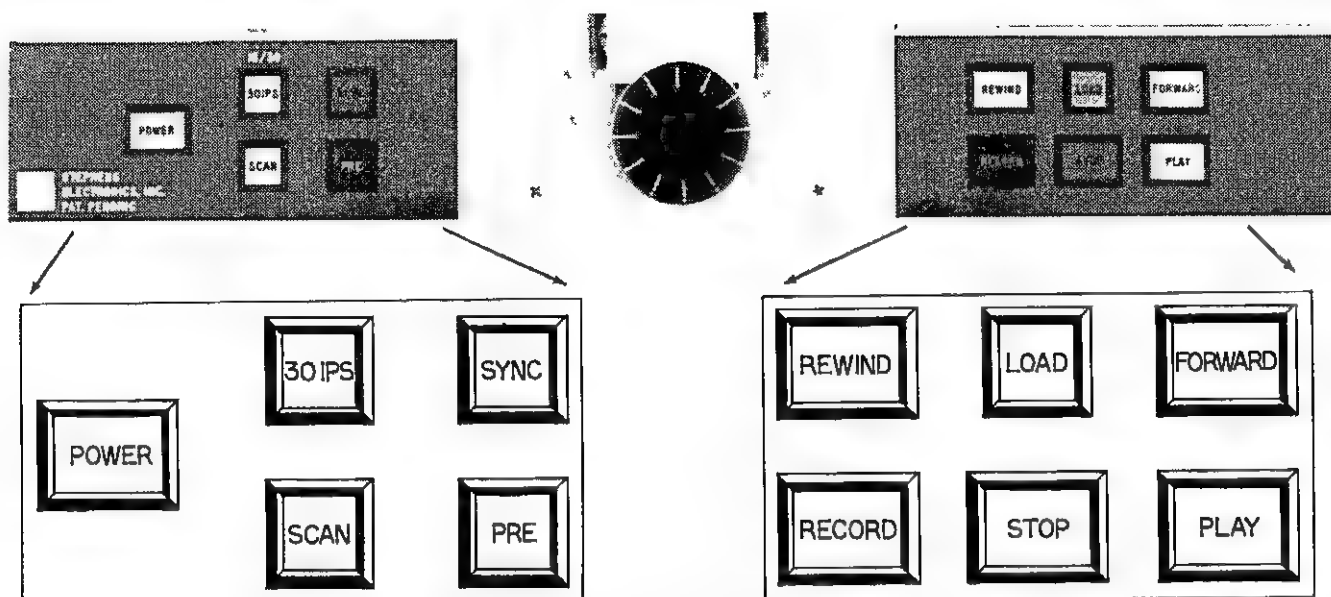


Figure 1-1. Transport Controls

1.1 CONTROLS & INDICATORS

1.1.1 TRANSPORT All transport-mounted controls are illuminated pushbutton switches. Some push-buttons are momentary type and others are alternate-action, but all buttons remain in the up position after being pressed. In some cases, the logic latches the switch function ON or OFF, and the button illumination conforms to the logic status.

DESCRIPTION



Controls the application of power to the transport and the electronics. The button lights when power is ON.



Selects the play/record speed for the transport. Press button for alternate action, 15ips or 30ips. The button is lit in 30ips mode. This button also switches the record/play electronics to conform to the speed selected.



This overrides the 15ips/30ips button and sets the transport for a play/record speed of 60ips. The button is lit when ON. This function is used primarily during playback for rapid location of program cues. For timing purposes, a program may be played at scan speed; the scan time is multiplied by 2 for 30ips play time, and is multiplied by 4 for 15ips play time. Scan may be used for recording, although the equalization remains at the 15ips or 30ips characteristic previously selected.



Switches the play amplifier between two sources, the record head or the play head, depending upon the sync status of the machine. In sync mode the button is lit and the play amp output of all channels is derived from the

record head, which is equal in quality to the play head.

When the machine is placed in record mode, the sync light goes out all channels not on record remain in sync. At this time, the play amp output of those channels actually recording is derived from the play head, while the monitor output from channels switched to PB (playback) is still derived from the record head. Sync is useful for punch-in recording (overdubbing).



(PRESET) This button activates the two presettable functions of the machine. These functions are Record/Input and Record/Mute, and are described fully in section 1.1.2. PRE is always ON, except when the machine is in play mode; then PRE may be switched ON or OFF by pressing the PRE button. The button lights whenever PRE is on.

CAUTION: Do not operate the tape motion controls for more than 5 seconds without tape threaded on the transport. An exception is noted under LOAD, on the following page.



This button sets the tape supply reel for fast winding. It can be initiated from any mode. The button lights when rewinding.



This button sets the tape takeup reel for fast winding. It can be initiated from any mode. Button lights when winding.



This button sets the machine for play mode, moving the tape at the selected speed. The button lights when in play or record mode, and it must also be pressed simultaneously with the Record button to initiate Record Mode.



This button sets the machine for record mode, provided the PLAY button is simultaneously pressed. The button lights when recording.

In order for individual tracks to actually record, the corresponding Mode Selector must be switched to one of the three Record *READY* positions. Refer to section 1.1.2 for details of the Mode Selector function.



This button stops the machine from any mode.

CAUTION: When the end of the tape runs off a reel, the LOAD button must be pressed. Pressing STOP under these circumstances will not stop the reel motors.



Shuts off all reel motors and drops the tape lifters when the button is pressed. Button is lit when in load mode. LOAD allows manually controlled tape motion by defeating the constant tension servo mechanism responsible for automatic slack takeup. It is useful for threading

tape and for editing. The machine will leave load mode when STOP or any motion button is subsequently depressed.

LOAD may be pressed simultaneously with another motion control. For example, pressing PLAY and LOAD permits precise cueing (play/load mode), and pressing PLAY, RECORD and LOAD permits spot-erasure (record/load mode).

NOTE: When spot erasure is complete, press the REWIND or FORWARD button to drop out of record without "clicks."

LOAD may be used when tape is not threaded but it is necessary to use the motion controls for alignment or check-out. Some motion may begin, but slight hand pressure on the reels will hold the tape stationary. A specific application of this function is to find out whether or not the machine is in PRE when switched to play mode; the desired PRE status may be selected without actually advancing the tape.

CAUTION: NEVER DEPRESS LOAD WITH A REEL OF TAPE THREADED AND MOVING. This removes the tape tension, and can cause uncontrolled spillage. LOAD should only be pressed when the reels are still, or when approaching 15' from the end of the tape.

1.1.2 SYNC PANEL Ready and Record indicators, a VU meter and a Mode Selector switch are mounted on the Sync Panel, one set per channel. The actual functions performed by these indicators and switches are somewhat complex, and are treated in greater detail elsewhere in section one. Below are listed brief descriptions of each item on the front of the Sync Panel.

ITEM	DESCRIPTION
VU METER	This reads the average signal level of the channel, either from the line input or the play amplifier output: the play amplifier derives its signal from either the record or the play head, depending upon the logic and switch functions (described elsewhere in section one). The meter is factory calibrated for 0 VU=+4 dBm (into 600 ohms).
READY Indicator (amber lens)	This lamp lights when the channel's Mode Selector switch is in any of the three Record positions, but the transport is not in record mode. The light is a signal that the channel will record as soon as the machine is placed in record mode.
RECORD Indicator (red lens)	This lamp lights when the channel's Mode Selector switch is in any of the three Record positions and the transport is in record mode. The light is a warning that the channel is actually recording.

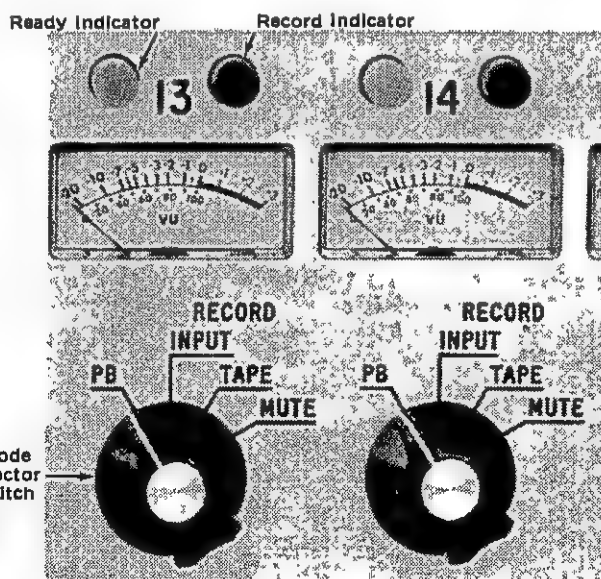
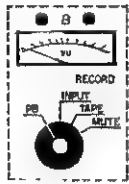


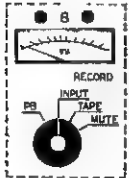
Figure 1-2. Sync Panel Controls & Indicators

MODE SELECTOR

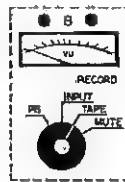
This switch determines the status of the record and playback electronics for the corresponding channel. There are four modes:



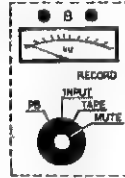
PB (Playback) This is the *SAFE* position from which the track cannot be erased or recorded. The channel output is derived from either the play or the record head, depending upon the sync status. The VU meter follows the channel output, whether derived from the record or play head.



RECORD/INPUT This is a *READY* mode from which the track may be recorded. The VU meter always follows the line input to the channel. The channel output is derived from the line input whenever PRE is lit, and from the play amplifier when PRE is off: the play amplifier signal is derived from the play head or record head, depending upon the sync status.



RECORD/TAPE This is a *READY* mode from which the track may be recorded. The VU meter and the channel output both follow the play amplifier output. The play amplifier output will always be from the play head unless the machine is in play/sync mode; then the output will be derived from the record head.



RECORD/MUTE This is a *READY* mode from which the track may be recorded. The VU meter always follows the line input to the channel. The channel output is muted (no output) whenever PRE is lit. Therefore, the only time when there is channel output is in play mode with PRE off. This output will be derived from the record head, or the play head, depending on the SYNC status.

1.2 PRE-OPERATING PROCEDURE

1.2.1 APPLY POWER Press the **POWER** button. This illuminates both the button and the VU meters, and prepares the machine for operation.



Selecting Scan speed (button lit) will advance the tape at 60ips in play or record modes. The equalization is not affected by the SCAN button.

1.2.2 SELECT TAPE SPEED The tape speed is determined in three ways. Each speed selector described below will override the previous one.



Select the desired play or record speed with this button. The speed is 30ips when the button is lit, and 15ips unlit. Electronic record/play equalization is automatically switched to conform to the selected tape speed.

The variable speed oscillator has a Locked/Variable speed switch. This switch does not affect the equalization. In Locked position (toggle switch up), the transport will play or record at the previously selected 15ips, 30ips or Scan speed. In Variable position (toggle switch down), the vernier dial may be adjusted to continuously vary the tape speed, to deviate $\pm 33\%$ from the selected speed.

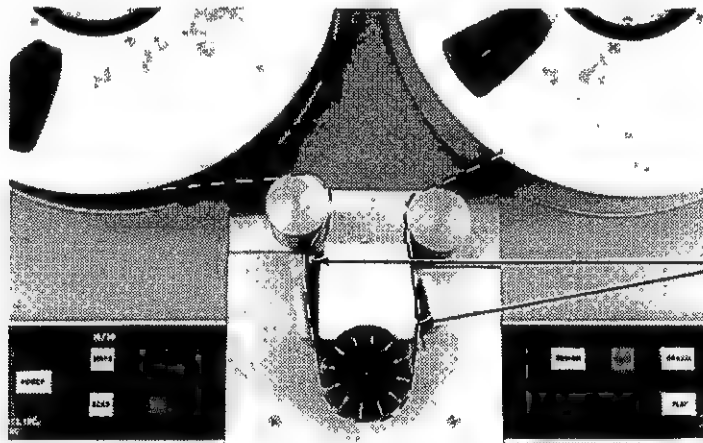


Figure 1-3.
Tape Threading Path

NOTE: Tape is routed outside lifters.

1.2.3 THREAD TAPE Only reels with NAB hubs, 4½" diameter (11.4cm) may be used. The supply and takeup reel sizes may be mixed since the transport servo mechanism automatically adjusts the motors to obtain the proper tape tension.

button. This eliminates the braking force and also prevents runaway motion of the reels. Thread the tape as illustrated in figure 1-3, anchoring the end to the hub of the takeup reel. Hand-turn the takeup reel to remove most of the slack, and press the **STOP** button; **STOP** removes the machine from load mode and fully tensions the tape.

To facilitate threading, apply power and press the **LOAD**

1.3 PLAYBACK

- Step 1** Set the Mode Selector of each channel to PB.
- Step 2** Apply power, select the desired speed, and thread the tape as described in section 1.2. Amber *READY* lights should not be lit.

- Step 3** Press the *PLAY* button to initiate playback. The channel outputs and VU levels will be derived from the play head. The audio quality from *SYNC* is the same as normal play mode.

- Step 4** Press the *STOP* button to end playback and stop tape motion.

NOTE: *If tape runs completely off the reel, press LOAD. Do not press STOP.*

1.4 FAST WINDING

1.4.1 FORWARD WINDING

- Step 1** Tape should be threaded, and power ON, as described in section 1.2.
- Step 2** Press the *FORWARD* button to initiate fast winding onto the takeup reel. This may be initiated from any mode.
- Step 3** Press the *STOP* button to end winding when the desired point is reached, unless the tape runs completely off a reel. In that case press the *LOAD* button.

1.4.2 REWINDING

- Step 1** Tape should be threaded, and power ON, as described in section 1.2.
- Step 2** Press the *REWIND* button to initiate fast winding onto the supply reel. This may be initiated from any mode.
- Step 3** Press the *STOP* button to end winding when the desired point is reached, unless the tape runs completely off a reel. In that case press the *LOAD* button.

1.5 RECORDING

NOTE: *Always bulk-erase any tape which was recorded on equipment with a different head configuration. This assures complete erasure.*

1.5.1 WITHOUT SYNC

- Step 1** Tape should be threaded with power ON, as described in section 1.2.
- Step 2** Set the Mode Selector switch for each channel. Channels to be recorded should be set to *RECORD/INPUT*, and the *READY* light will turn on. Channels not to be recorded should be set to *PB*.
- Step 3** Apply a test signal or sample program material to the input of all channels to be recorded. Adjust the input levels so that the corresponding VU meters indicate no more than 0 VU for most peaks.* Extreme peaks may indicate +2 or +3.
- Step 4** When ready to record, press the *PLAY* button and hold it down while pressing the *RECORD* button. All channels that were in *READY* will now record; the amber lights will turn off and the red lights will turn on.

NOTE: *The VU readings and audio output of the channel(s) recording are now derived from the line input. For*

monitoring the actual recorded signal, set the Mode Selector(s) to Record/Tape; the VU reading(s) and channel output(s) will now be derived from the play head.

- Step 5** Press the *STOP* button to end recording and stop the tape motion, unless the tape has run completely off the supply reel; in that case, press *LOAD*.

1.5.2 WITH SYNC The Sync feature allows recordings to be made in synchronization with previously recorded program material. In order to achieve the correct timing, all channel outputs are derived from the record head while the machine is in *PLAY/SYNC* mode. As soon as the *RECORD* button is pressed, placing the machine in *RECORD/SYNC* mode, the input to channels in *RECORD* replaces the record head output. For channels in *PB*, the record head output continues to feed the channel output, so that a performer or engineer may monitor the new recording in synchronization with the existing tracks.

- Step 1** With power ON, thread tape on the transport, as described in section 1.2.
- Step 2** Set the Mode Selector for each channel; channels to be recorded should be set to *RECORD/INPUT*. Previously recorded or unused channels should be protected by setting the Mode Selector to *PB*.

* 0 VU is factory calibrated to a level of +4 dBm.

- Step 3** Depress the SYNC button. It should light, indicating the machine is ready to play and record in sync.
- Step 4** Apply a test signal or sample program material to the input of those channels to be recorded. Adjust the input levels so that the corresponding VU meters show peaks of no more than 0 VU. Extreme peaks may indicate +2 or +3 VU.
- NOTE:** *During synchronized recording, some performers prefer to have their channel(s) muted. If the Mode Selector is placed in RECORD/MUTE, then the desired effect will be achieved; the channel will have no audio output while recording. The output during PLAY will be muted if PRE is lit, or will be derived from the record head if PRE is off.*
- Step 5** Press the PLAY button. The output of all previously recorded channels may now be monitored, and at the instant recording is to begin, the PLAY and RECORD buttons may be depressed.
- Step 6** By switching the Mode Selectors to RECORD/TAPE, the quality of the recorded signal may be monitored. This mode of monitoring is generally preferred, so long as the output from the channels is not fed to the performer; since there is a time delay, such monitoring could be disconcerting.
- Step 7** Press the STOP button to end recording and halt the tape motion, unless the tape has run completely off the supply reel. In that case, press LOAD.

1.6 EDITING

The two edit modes available are PLAY/LOAD and PLAY/SCAN. The PLAY/LOAD mode should be entered only from STOP mode. It is used to precisely locate cues. IN PLAY/LOAD, the reel motors do not maintain tape tension, so the tape may be manually controlled. This also makes splicing easy, since slack is not automatically taken up. To leave PLAY/LOAD mode, press STOP or any other motion button.

PLAY/SCAN is helpful for rough location of program cues. Pressing the SCAN button sets the transport for a 60ips speed, although equalization remains at the 15ips or 30ips setting previously selected. When PLAY is then pressed, the machine will play at 60ips. SCAN may be punched in and out during the playback of a tape. To leave SCAN mode, press the SCAN button a second time.

NOTE: *RECORD/SCAN mode may be used, and recording will occur at the rate of 60ips. But equalization remains optimized for 15ips or 30ips. RECORD/LOAD mode may be used to achieve spot erasures, but care must be taken to assure that the erase head, not the record head, is aligned with the point where erasure is to begin. Press REWIND or FORWARD when erasure is complete to eliminate punch-out "clicks."*

SECTION TWO
ELECTRONIC ALIGNMENT AND
TAPE HANDLING ADJUSTMENT

2.1 ELECTRONIC ALIGNMENT

The record and playback electronics are aligned in a manner similar to other professional tape machines. The equalization curves fall within NAB specifications, although there is some deviation from the idealized NAB curve which enables Stephens' machines to record low frequencies at greater levels before reaching tape saturation. Nevertheless, standard NAB alignment tapes are used in the following procedures.

Stephens' heads are factory calibrated to the proper azimuth, zenith and meridian. Because the heads and transport top plates are precision machined, no further mechanical alignment is necessary.

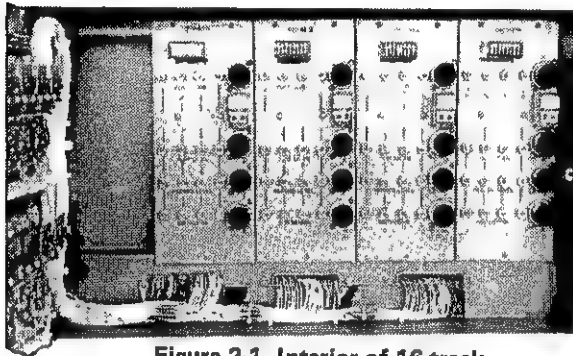
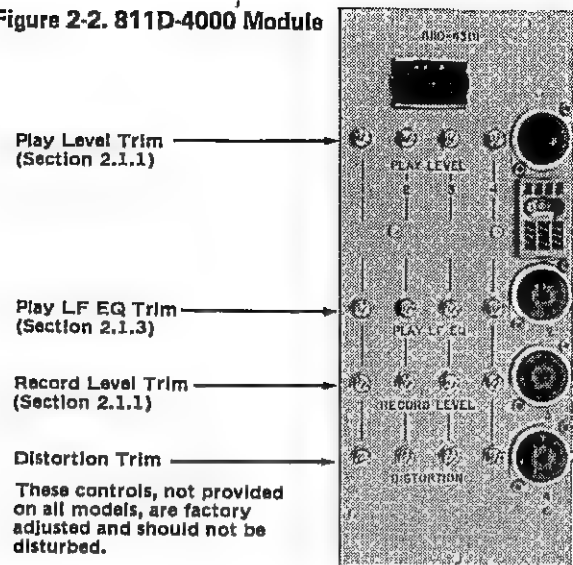


Figure 2-1. Interior of 16-track Sync Panel showing 811D-4000 Modules

2.1.1 PLAY LEVEL & EQUALIZATION

- Step 1** Degauss the heads in accordance with standard procedures. This is a conventional method for removing any residual magnetism from the heads, magnetism which may otherwise degrade the high frequencies on delicate alignment tapes, interfering with proper level calibration.
- Step 2** Turn power ON and press LOAD. Thread a standard NAB alignment tape for the appropriate speed on the transport. A Full-Track alignment tape is preferable.
- NOTE:** *It is generally desirable to store alignment tapes with the tail end out. Therefore, the tape will be threaded from the right to the left, and rewound. This procedure assures evenly wound tape.*
- Step 3** Set the transport speed to correspond with the alignment tape, 15ips or 30ips.
- Step 4** Set all sync panel Model Selectors to PB.
- Step 5** Undo the latch on the sync panel, and swing the panel open, revealing the 811D-4300 series modules. Refer to figure 2-1.

Figure 2-2. 811D-4000 Module



- Step 6** Press the PLAY button, and locate a 0 VU reference on the taps, preferably at 1000Hz.
- Step 7** Adjust the PLAY LEVEL of each channel (the trimmer on the top row of the 4300 module) so the corresponding VU meter indicates 0 dB. Refer to figure 2-2.
- Step 8** Press the STOP button.

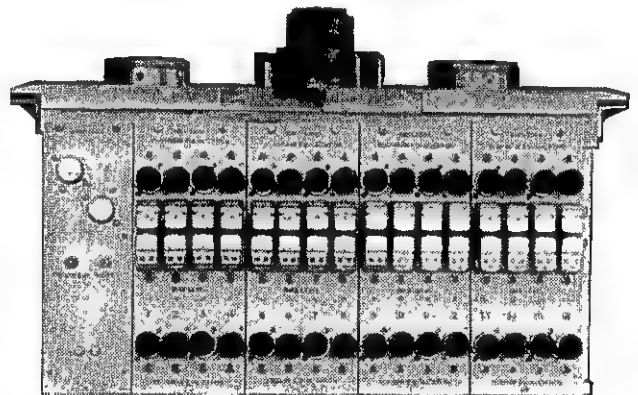
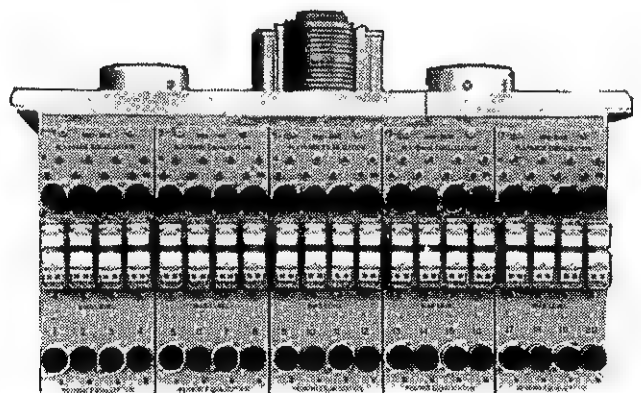


Figure 2-3. Front of Model 103 Transport 16-track (above) and 24-track (below)



- Step 9** Locate the 811D-3000 series modules at the front edge of the transport; cabinets have a door which swings down for access to these modules when the pair of buttons at the upper corners are depressed.

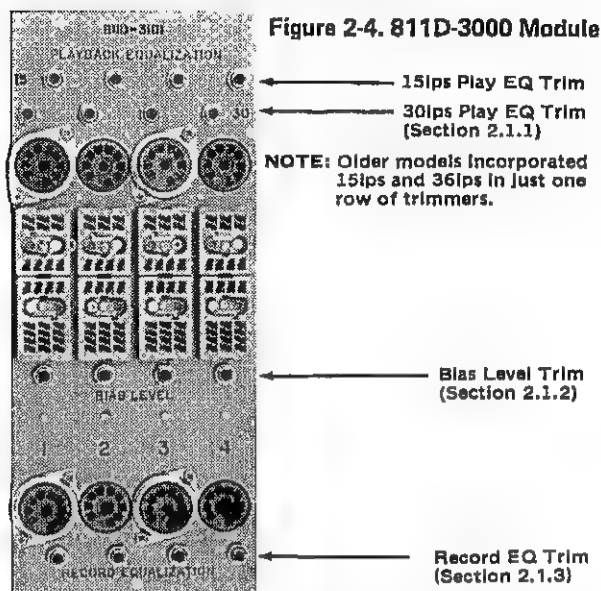


Figure 2-4. 811D-3000 Module

- Step 10** Place the machine in PLAY mode, and locate the 0 VU, 15 kHz reference on the tape.
- Step 11** Adjust each channel's PLAYBACK EQUALIZATION (trimmers located on the 811D-3000 series modules), so the corresponding VU meter indicates 0 dB. (Refer to fig. 2-4.)

NOTE: Adjust the trimmers corresponding to the tape speed; top row for 15ips and lower row for 30ips. Early models are equipped with just one set of trimmers, used for either play speed.

- Step 12** Press FORWARD, and wind the alignment tape to the end; then press LOAD and remove the tape from the transport.

This completes the playback alignment. All controls may be left as they are, with the 811D-3000 modules exposed, in preparation for the following procedures.

2.1.2 BIAS LEVEL & RECORD LEVEL The front of the transport should be exposed, as described in 2.1.1, step 9. Power is ON.

- Step 1** Thread a blank tape on the transport (section 1.2.3).
- Step 2** Set all Mode Selectors to RECORD/TAPE.
- NOTE:** The procedures outlined in steps 3-7 are to be performed for each channel in succession.
- Step 3** Apply a 1000 Hz, +4 dBm sine wave to input.
- Step 4** Adjust the RECORD LEVEL trimmer (in the sync panel, see figure 2-2) to approximately mid rotation.

- Step 5** Press PLAY and RECORD, placing the machine in record mode.
- Step 6** Set the BIAS LEVEL trimmer (on the 811D-3000 module, see figure 2-4) by turning it clockwise until the corresponding VU meter reaches a peak, then continue to turn clockwise until the level drops 1/4 to 1/8 dB below the peak.
- Step 7** Readjust the RECORD LEVEL trimmer so that the VU meter indicates 0 dB.
- Step 8** Press STOP. This completes the record and bias level adjustments.

2.1.3 BIAS FREQUENCY & SYMMETRY

Trimmers for bias frequency and symmetry are located on the bias module, and are set at the factory for optimum performance. While the bias frequency does not affect the quality of the recorded signal, it does affect the efficiency of conversion of the electrical signal to the magnetic flux. The frequency is therefore factory set for maximum efficiency with the largest number of tracks in RECORD mode. The symmetry control, labeled NOISE, affects the waveform of the bias, and consequently the noise level of the unmodulated, recorded tape. The noise setting is not critical; however, if the optimum noise characteristic is desired, bias symmetry may be adjusted as follows:

- Step 1** The transport should be oriented so that the bias module is accessible. On machines of up to 16 tracks, the bias module is mounted on the front of the transport. 24 track or larger machines may have twin bias modules beneath the transport; one module is slaved to the other, so only one set of frequency & symmetry trimmers is provided.
- Step 2** Thread a blank tape on the transport (section 1.2.3), with power ON.

Step 3 To arrive at the optimum symmetry setting, first determine the number of tracks which are simultaneously placed in RECORD MODE. For example, a 24 track machine may be operated with just 8 tracks in record mode at any given time. Set this number of tracks in RECORD/TAPE position with the sync panel mode selector. The resulting load on the bias circuit is slight but it will enable the most accurate setting of the symmetry (noise) control.

Step 4 Monitor the output of any one of those tracks placed in RECORD; then place the transport in RECORD MODE by pressing the PLAY and RECORD buttons simultaneously.

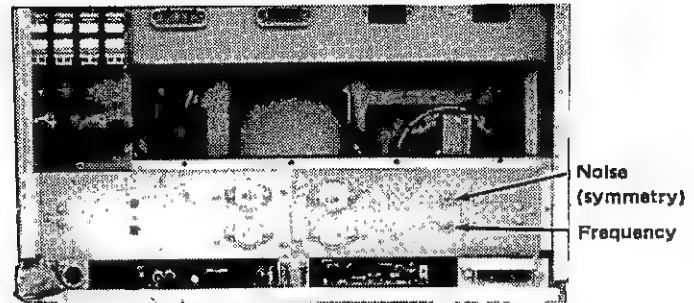


Figure 2-5. Bias Modules Beneath 24/40 Track Transport

Step 5 Adjust the NOISE trimmer for the minimum noise on the track being monitored (monitoring can be done with a voltmeter or by ear).

Step 6 Press STOP. This completes the symmetry adjustment.

2.1.4 RECORD EQ The 811D-3000 modules should be accessible, as described in section 2.1.1, step 9. A test oscillator should be available for connection to the input of each channel (or by means of input assignment through the mixing console).

Step 1 Turn the power ON, and thread a blank tape on the transport.

Step 2 Set all sync panel Mode Selectors to RECORD/TAPE.

Step 3 Press the PLAY and RECORD buttons, placing the machine in record mode.

NOTE: The procedures outlined in steps 4-7 are to be performed for each channel in succession.

Step 4 Apply a 15 kHz, +4 dBm sine wave to the input.

Step 5 Adjust the RECORD EQUALIZATION (trimmer located on the 811D-

3000 module, see figure 2-4) so the corresponding VU meter indicates 0 dB.

NOTE: Steps 6 and 7 are required only for 15ips alignment. For 30ips alignment, proceed with step 8.

Step 6 Change the input signal to a +4 dBm sine wave of between 35 and 40 Hz.

Step 7 Adjust the PLAY LF EQ (trimmer in the sync panel, see figure 2-2) so the corresponding VU meter indicates 0 dB.

Step 8 Press REWIND and when the tape runs off the takeup reel, press LOAD. This completes the recording equalization adjustments.

NOTE: It is considered a safe practice to reset all Mode Selectors to PB, unless recording is to be done immediately following the alignment procedure.

2.2 TAPE MOTION ADJUSTMENTS

The Stephens' transport is designed for gentle tape handling without need for mechanical adjustments. The servo-operated supply and takeup motors are controlled by circuitry which compares the actual tape motion with the desired motion. This is done by means of a tachometer and a discrimination circuit which integrates the measured tape speed with motion sensing inputs from each motor and with a synchronization signal from an internal clock or an external oscillator/resolver. Therefore, the only adjustments required are electrical in nature.

2.2.1 TAPE TENSION ADJUSTMENT

The following adjustment requires a voltmeter capable of accurately indicating 10 volts dc. The bottom of the transport must be accessible (see section 2.1.1, step 9).

Step 1 Connect a voltmeter across the 5-ohm resistor on the power supply. The meter should be set to the 10 Vdc scale (or higher), with the leads connected as shown in figure 2-6.

Step 2 Apply power to the transport and thread a reel of tape.

Step 3 Press the PLAY button, placing the transport in motion at 15ips or 30ips.

Step 4 Locate the tension trimmer on the SERVO CONTROL BOARD beneath the transport and adjust it for a reading of 10 volts across the power resistor (for 2" tape, 1" tape requires 7 volts). See figure 2-7.

- Step 5** Press the STOP button, and disconnect the voltmeter leads from the power resistor. This completes the tension adjustment.

Connect Voltmeter across
this resistor
Twisted lead (+)
Gray lead (-)

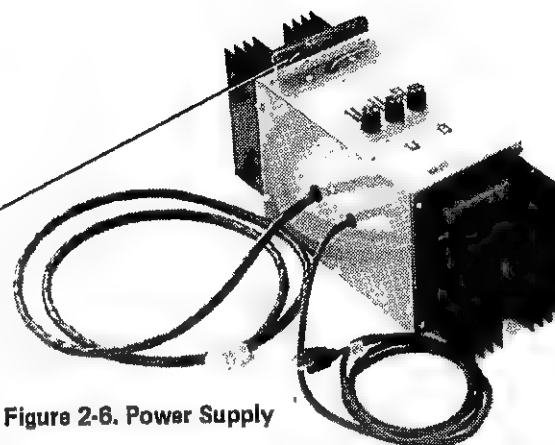


Figure 2-6. Power Supply

2.2.2 SLACK ADJUSTMENT The bottom of the transport must be accessible (see section 1.1.1, step 9).

- Step 1** With no tape threaded on the transport, turn the power ON and press the STOP button.
- Step 2** Locate the SLACK control on the SERVO CONTROL BOARD (refer to figure 2-7).
- Step 3** Adjust the SLACK trimmer in a clockwise direction until the supply motor does not move.
- Step 4** Then rotate the trimmer counterclockwise until the motor just begins to move; it may alternately start and stop. This is the correct setting for the SLACK trimmer.
- Step 5** Turn off the power. The adjustment is complete.

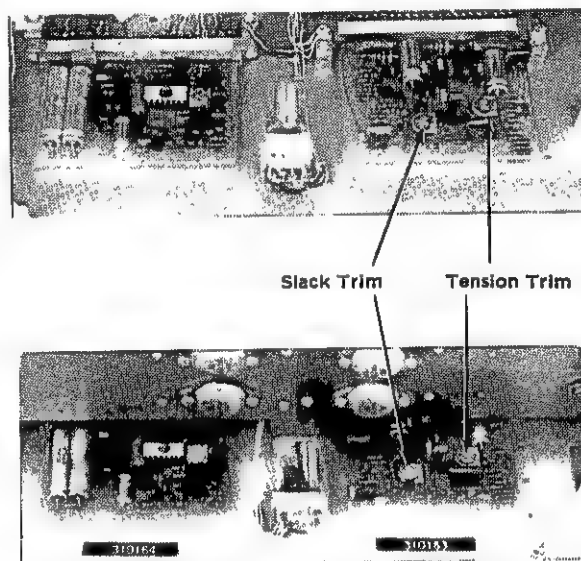


Figure 2-7. Servo and Resolver Boards
4 – 16-track (above) and 24 – 40-track (below)

2.2.3 SPEED ADJUSTMENT The fixed running speed of the transport may be precisely calibrated to 15ips, 30ips and 60ips by means of three independent trimmers. These trimmers are adjusted using the meter in the remote VSO unit. Three tachometer-triggered counter outputs in the transport provide approximately 60 Hz pulses for 15ips, 30ips and 60ips running speeds. When a given tape speed is precisely adjusted, the counter output will be exactly 60 Hz, corresponding to the sync signal. The sync signal is derived from the power mains or from an optional crystal/resolver input. At exact speed, the VSO meter will settle at mid-scale, rather than follow the beat of the out-of-phase signals.

The following adjustment may be done for one, two or all three tape speeds; speed trimmers for 15, 30 and 60ips are recessed beneath a cover plate, near the power button.

- Step 1** Turn the power ON, and thread a reel of tape.
- Step 2** Place the transport in PLAY mode, with the desired speed selected (i.e. 15ips, 30ips or SCAN).

- Step 3** Observe the VSO meter, with the VSO switched to fixed speed mode.

NOTE: The VSO meter should stabilize near mid-scale as the tape reaches full running speed. If there is a large rhythmic motion of the needle, then the speed must be adjusted. If the meter has a slight motion, but is near mid-scale, then adjustment is not necessary.

- Step 4** Remove the cover plate surrounding the POWER, PRE SCAN, SYNC and 30ips buttons. This may be done by inserting a screwdriver blade between the cabinet and the transport and prying up the cover.
- Step 5** Insert a screwdriver in the trimmer which corresponds to the speed selected. Adjust the trimmer gradually until the meter needle comes to rest at

mid-scale (see fig. 2-8). Due to temperature sensitivity, some upscale drift occurs if this adjustment is made when the machine has just been turned on. Therefore, it may be desirable to set the meter for a reading below mid-scale, allowing for the drift. Since the important factor is the stabilization of the needle, rather than the actual value on the scale, any stable setting from 0.3 to 0.7 is acceptable. The meter indicates phase lock rather than actual speed.

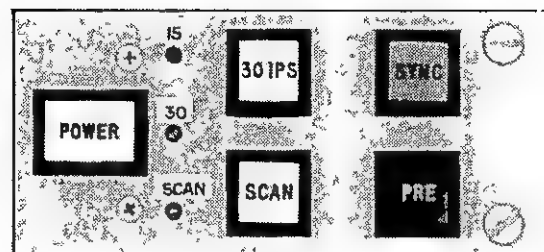


Figure 2-8. Speed Trimmers

- Step 6** Press STOP. If other speed calibration is required, repeat steps 2, 3 and 5 before replacing the cover plate.
- Step 7** Turn the power OFF and replace the cover plate.
-

3.1 GENERAL

The installation procedure for all Stephens Electronics tape machines is very straightforward. The power supply, sync panel and VSO package join the transport by means of three or four factory-wired connectors. All audio input and output, as well as remote control circuits for Dolby or equivalent type noise reduction units, must be wired to from one to four connectors which then plug into the sync panel.* Finally, the power supply plugs into a suitable 115VAC/60Hz main, and the machine is ready to operate.

The following paragraphs describe each step in full detail, including the essential connector locations, wiring diagrams, and wire termination information.

3.2 POWER SUPPLY

3.2.1 LOCATION The power supply may be located nearly anywhere, provided the interconnecting cable is long enough to reach the underside of the transport. The bottom of the floor-standing cabinet is an ideal location. In other locations, allow adequate space for convection cooling.

3.2.2 FUNCTION The power supply provides the machine with three DC voltages for audio and logic circuitry; *all DC voltages are wired for positive ground.* There are regulated -27V and unregulated -37V referenced to one ground (common), with a separate -62V output and ground.

The forementioned outputs are wired to the power supply connector with dual leads for added power handling capability and protection against breakage. A 17VAC output provides 60Hz reference for the phase comparator circuit. This circuit determines the transport speed. Other leads in the power supply cable include: the 115VAC input to the transformers, switched by the POWER button on the transport, and the circuitry for both motor drive transistors (located in the power supply).

3.2.3 CONNECTION The power cable mates with a connector on the rear flange of the chassis, beneath the transport. The chassis connector (JA), Amphenol No. 222-22N31, is keyed to assure correct insertion.

CAUTION: Prior to inserting the 115VAC plug in the power outlet, make certain the outlet does carry the correct voltage (at 60Hz). For 50Hz line frequencies, a special adapter must be used (consult your dealer or contact Stephens Electronics).

*The 24-track, Model 821-C electronics have remote switching capability for each channel in the sync panel, ie; PB, REC-INPUT, REC-TAPE or REC-MUTE. In addition to the two I/O connectors and the two transport harness connectors on that sync panel, a fifth connector is provided for the optional switching unit (J25).

3.3 VSO

3.3.1 LOCATION The VSO package is intended for operation either at the tape machine or remotely. A convenient location is on top of the sync panel. The position locator option, when ordered, is housed in the VSO package.

3.3.2 FUNCTION The VSO serves two purposes. It can be used to vary the speed of the transport $\pm 33\%$ from the selected speed. In other words: at 15ips, the VSO permits speeds from 10ips to 20 ips; at 30ips, the VSO permits speeds from 20ips to 40ips; at SCAN (60ips), the VSO permits speeds from 40ips to 80ips. The toggle switch on the VSO selects the fixed transport speed (switch up) or the variable speed (switch down), and a vernier dial with a digital logging scale permits precise adjustment in variable speed mode.

The second function of the VSO is described in section two of this manual. The meter can be used to calibrate the fixed speeds. Since the meter displays phase, it is not used to indicate the actual running speed of the transport.

3.3.3 CONNECTION The VSO cable mates with a connector on the rear flange of the chassis, beneath the transport. The chassis connector (JH), Amphenol No. 57-40360, is keyed to assure correct insertion.

NOTE: *The VSO must be connected in order for the machine to operate properly, even though fixed speed operation is desired.*

3.4 SYNC PANEL-TRANSPORT HARNESS

3.4.1 LOCATION A wiring harness emerges from the rear of the transport. Four track to sixteen track machines have just one connector at the end of this harness (J5), whereas larger machines have two connectors (J5 and J6).

3.4.2 FUNCTION This harness provides DC power for the lamps and amplifiers in the sync panel. Additionally, it provides status information on the SYNC and PRE functions, and audio interconnection between the sync panel and the transport-mounted audio circuits. J5 accommodates channel 1 through channel 20, and J6 carries the rest of the channels.

3.4.3 CONNECTION Each harness connector mates with a green Amphenol connector, No. 220-1N104, on the rear of the sync panel. Refer to the diagrams in section 3.5 for identification of J5 and J6.

3.5 SYNC PANEL-STUDIO INTERFACE (I/O CONNECTIONS)

3.5.1 FUNCTION Based on the total number of channels, either one, two or four plugs carry the audio input and output between the tape machine and the studio. The same connectors (J20 through J23) also carry -24V control signals (positive ground) for remote switching of Dolby or equivalent noise reduction equipment. Most customers prefer to wire the I/O connectors at or just prior to the installation of the tape machine.

However, Stephens Electronics will provide custom harnesses as an option. Such harnesses must be ordered at least 30 days prior to delivery, and orders must include full details of connector type, lead dress, and so forth.

3.5.2 CONNECTION The following diagrams illustrate the connector locations and channel allocations for each sync panel, from 4-track to 40-track. Accompanying lists show the specific pin assignments. Note that the assignments vary, depending on the size of the machine. All audio circuits are unbalanced. Connectors are Amphenol No. 57-30500.

In 8-track or larger machines, all input and output grounds are bussed together (except the 24V common). Thin bus bar should be used to accomplish these connections, and the bar should clear the connector pins by approx. 1/8". Twin-conductor shielded cable is recommended for audio leads, with the low conductor and shield joined together at both ends of the cable. The low and shield can be soldered to the bus bar on the I/O connector.

The noise reduction/remote control circuits, if used, should be wired with shielded multi-conductor cable. While the shield is not absolutely necessary, it will reduce the possibility of noise from switching transients during SYNC recording.

4-TRACK

PIN NO.	CONNECTION	CONNECTOR NO. J20
1	NOT USED	
2	"	
3	"	
4	"	
5	"	
6	"	
7	"	
8	"	
9	"	
10	Record Input, GND	1
11	"	2
12	"	3
13	"	4
14	NOT USED	
15	"	
16	"	
17	"	
18	Playback Out, GND	1
19	"	2
20	"	3
21	"	4
22	NOT USED	
23	"	
24	"	
25	"	
26	Dolby Control, 24V	1
27	"	2
28	"	3
29	"	4
30	NOT USED	
31	"	
32	"	
33	"	
34	Dolby Control, Com	
35	Record Input, High	1
36	"	2
37	"	3
38	"	4
39	NOT USED	
40	"	
41	"	
42	"	
43	Playback Out, High	1
44	"	2
45	"	3
46	"	4
47	NOT USED	
48	"	
49	"	
50	"	

8-TRACK

PIN NO.	CONNECTION	CONNECTOR NO. J20
1	NOT USED	
2	"	
3	"	
4	"	
5	"	
6	"	
7	"	
8	"	
9	"	
10	Record Input, GND	1
11	"	2
12	"	3
13	"	4
14	"	5
15	"	6
16	"	7
17	"	8
18	Playback Out, GND	1
19	"	2
20	"	3
21	"	4
22	"	5
23	"	6
24	"	7
25	"	8
26	Dolby Control, 24V	1
27	"	2
28	"	3
29	"	4
30	"	5
31	"	6
32	"	7
33	"	8
34	Dolby Control, Com	
35	Record Input, High	1
36	"	2
37	"	3
38	"	4
39	"	5
40	"	6
41	"	7
42	"	8
43	Playback Out, High	1
44	"	2
45	"	3
46	"	4
47	"	5
48	"	6
49	"	7
50	"	8

Sync Panel Audio Connector Wiring

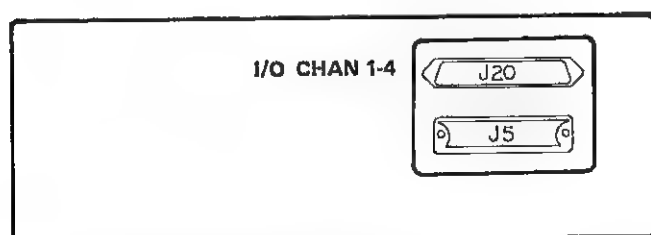


Figure 3-1. 4-Track Sync Panel, Rear Connectors

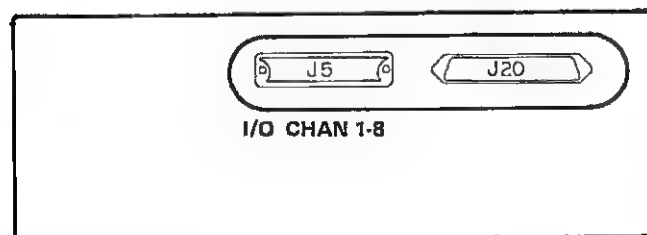
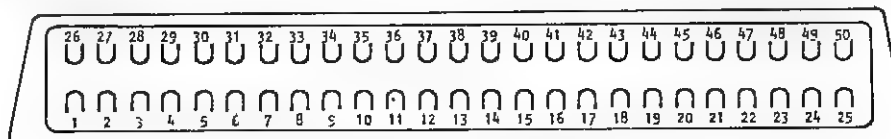
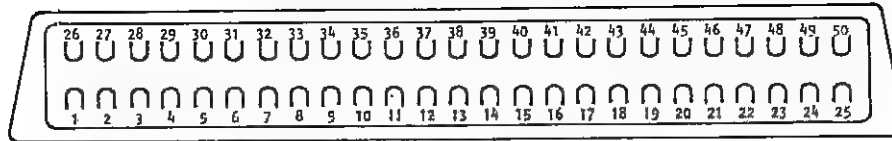


Figure 3-2. 8-Track Sync Panel, Rear Connectors



I/O CONNECTOR WIRING SIDE



I/O CONNECTOR WIRING SIDE

16-TRACK
Audio Connector Wiring

PIN NO.	CONNECTION	CONNECTOR NO.		PIN NO.	CONNECTION	CONNECTOR NO.	
		J20	J21			J20	J21
1	NOT USED			26	Dolby Control, 24V	1	9
2	"			27	"	2	10
3	"			28	"	3	11
4	"			29	"	4	12
5	"			30	"	5	13
6	"			31	"	6	14
7	"			32	"	7	15
8	"			33	"	8	16
9	"			34	Dolby Control, COM		
10	REC & PB, GNDS			35	Record Input, High	1	9
11	"			36	"	2	10
12	"			37	"	3	11
13	"			38	"	4	12
14	"			39	"	5	13
15	"			40	"	6	14
16	"			41	"	7	15
17	"			42	"	8	16
18	"			43	Playback Out, High	1	9
19	"			44	"	2	10
20	"			45	"	3	11
21	"			46	"	4	12
22	"			47	"	5	13
23	"			48	"	6	14
24	"			49	"	7	15
25	"			50	"	8	16

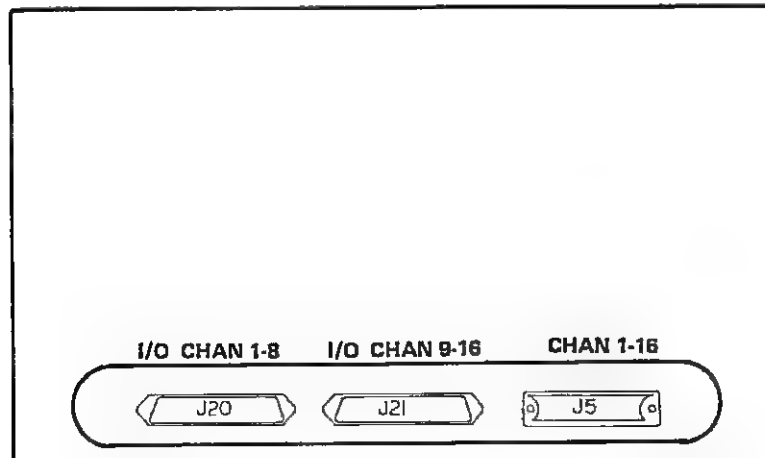
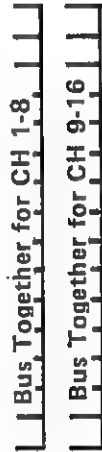
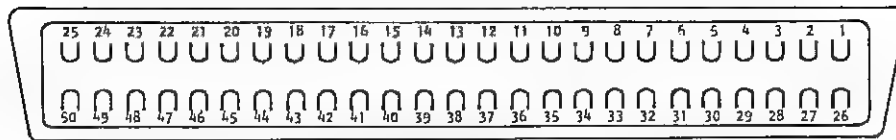


Figure 3-3. 16-Track Sync Panel, Rear Connectors

24-Track Sync Panel Audio Connector Wiring

page 3-5



I/O CONNECTOR WIRING SIDE

PIN NO.	CONNECTION	CONNECTOR NO.		PIN NO.	CONNECTION	CONNECTOR NO.	
		J20	J21			J20	J21
1	Playback Out, High	1	13	26	Dolby Control, 24V	1	13
2	"	2	14	27	"	2	14
3	"	3	15	28	"	3	15
4	"	4	16	29	"	4	16
5	"	5	17	30	"	5	17
6	"	6	18	31	"	6	18
7	"	7	19	32	"	7	19
8	"	8	20	33	"	8	20
9	"	9	21	34	"	9	21
10	"	10	22	35	"	10	22
11	"	11	23	36	"	11	23
12	Playback Out, High	12	24	37	Dolby Control, 24V	12	24
13	Record Input, High	1	13	38	Dolby Control, Common		
14	"	2	14	39	REC & PB Grounds	B	
15	"	3	15	40	"	U	
16	"	4	16	41	"	S	
17	"	5	17	42	"	T	
18	"	6	18	43	"	O	
19	"	7	19	44	"	G	
20	"	8	20	45	"	E	
21	"	9	21	46	"	T	
22	"	10	22	47	"	H	
23	"	11	23	48	"	E	
24	Record Input, High	12	24	49	"	R	
25	NOT USED			50	REC & PB Grounds		

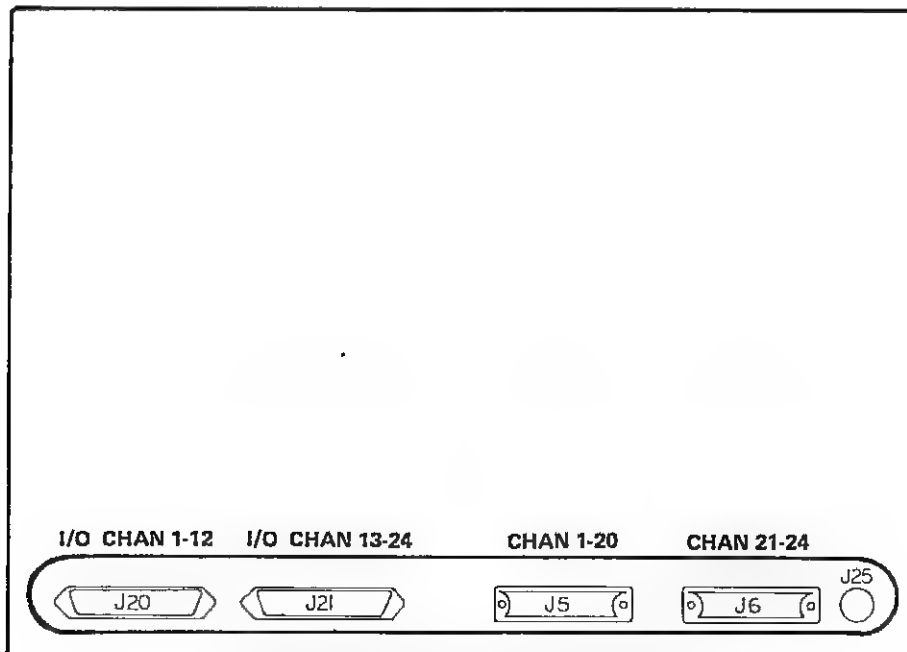
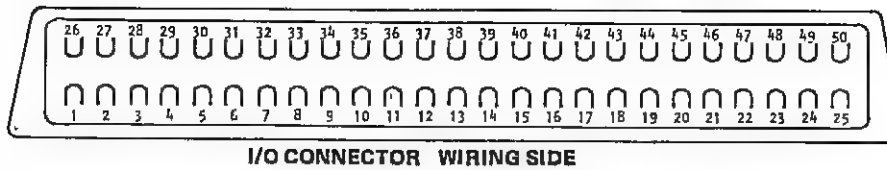


Figure 3-4. 24-Track Sync Panel, Rear Connectors

32-Track Sync Panel Audio Connector Wiring

page 3-6



PIN NO.	CONNECTION	CONNECTOR NO.				PIN NO.	CONNECTION	CONNECTOR NO.			
		J20	J21	J22	J23			J20	J21	J22	J23
1	NOT USED					26	Dolby Control, 24V	1	9	17	25
2	"					27	"	2	10	18	26
3	"					28	"	3	11	19	27
4	"					29	"	4	12	20	28
5	"					30	"	5	13	21	29
6	"					31	"	6	14	22	30
7	"					32	"	7	15	23	31
8	"					33	Dolby Control, 24V	8	16	24	32
9	"					34	Dolby Control, Common				
10	REC & PB GNDS	B				35	Record Input, High	1	9	17	25
11	"	U				36	"	2	10	18	26
12	"	S				37	"	3	11	19	27
13	"					38	"	4	12	20	28
14	"	T				39	"	5	13	21	29
15	"	O				40	"	6	14	22	30
16	"	G				41	"	7	15	23	31
17	"	E				42	Record Input, High	8	16	24	32
18	"	T				43	Playback Out, High	1	9	17	25
19	"	H				44	"	2	10	18	26
20	"	E				45	"	3	11	19	27
21	"	R				46	"	4	12	20	28
22	"					47	"	5	13	21	29
23	"	10				48	"	6	14	22	30
24	"	to				49	"	7	15	23	31
25	"	25				50	"	8	16	24	32

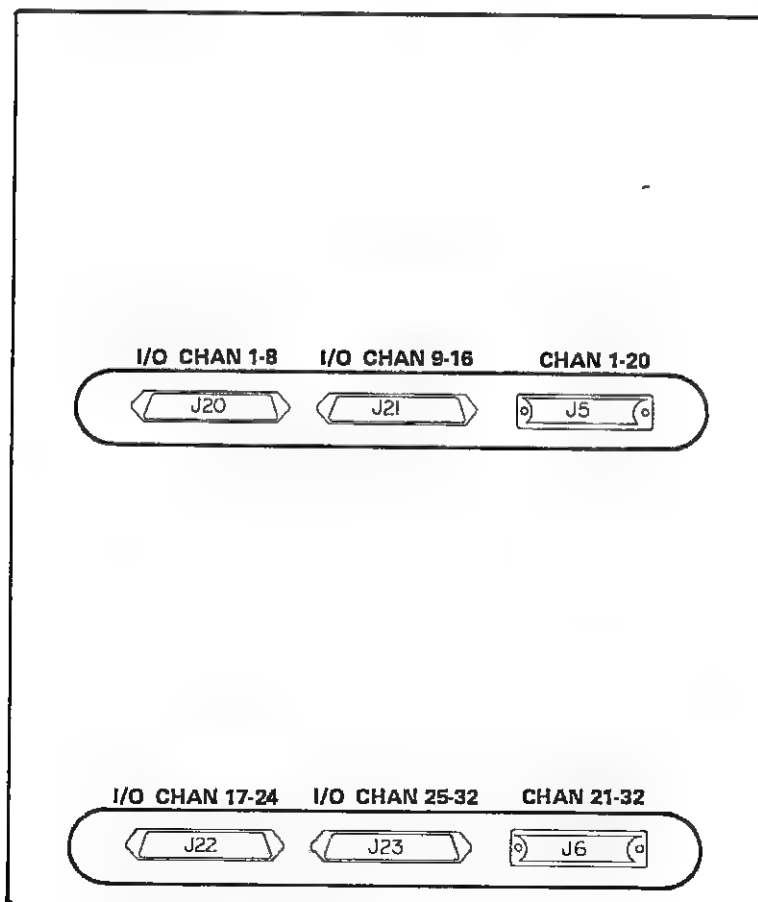
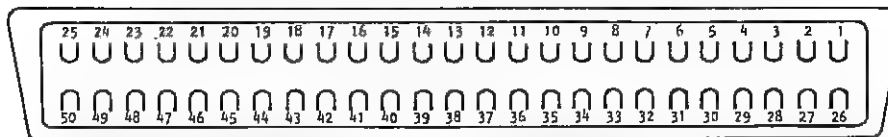


Figure 3-5. 32-Track Sync Panel, Rear Connectors



I/O CONNECTOR WIRING SIDE

PIN NO.	CONNECTION	CONNECTOR NO.				PIN NO.	CONNECTION	CONNECTOR NO.			
		J20	J21	J22	J23			J20	J21	J22	J23
1	Playback Out, High	1	11	21	31	26	REC & PB GNDS	B			
2	"	2	12	22	32	27	"	U			
3	"	3	13	23	33	28	"	S			
4	"	4	14	24	34	29	"				
5	"	5	15	25	35	30	"	T			
6	"	6	16	26	36	31	"	O			
7	"	7	17	27	37	32	"	G			
8	"	8	18	28	38	33	"	E			
9	"	9	19	29	39	34	"	T			
10	Playback Out, High	10	20	30	40	35	"	H			
11	Record Input, High	1	11	21	31	36	"	E			
12	"	2	12	22	32	37	"	R			
13	"	3	13	23	33	38	"				
14	"	4	14	24	34	39	"	P			
15	"	5	15	25	35	40	"	I			
16	"	6	16	26	36	41	"	N			
17	"	7	17	27	37	42	"	26			
18	"	8	18	28	38	43	"	to			
19	"	9	19	29	39	44	REC & PB GNDS	44			
20	Record Input, High	10	20	30	40	45	Dolby Control, Common	6	16	26	36
21	Dolby Control, 24V	1	11	21	31	46	Dolby Control, 24V	7	17	27	37
22	"	2	12	22	32	47	"	8	18	28	38
23	"	3	13	23	33	48	"	9	19	29	39
24	"	4	14	24	34	49	"	10	20	30	40
25	"	5	15	25	35	50	Dolby Control, 24V				

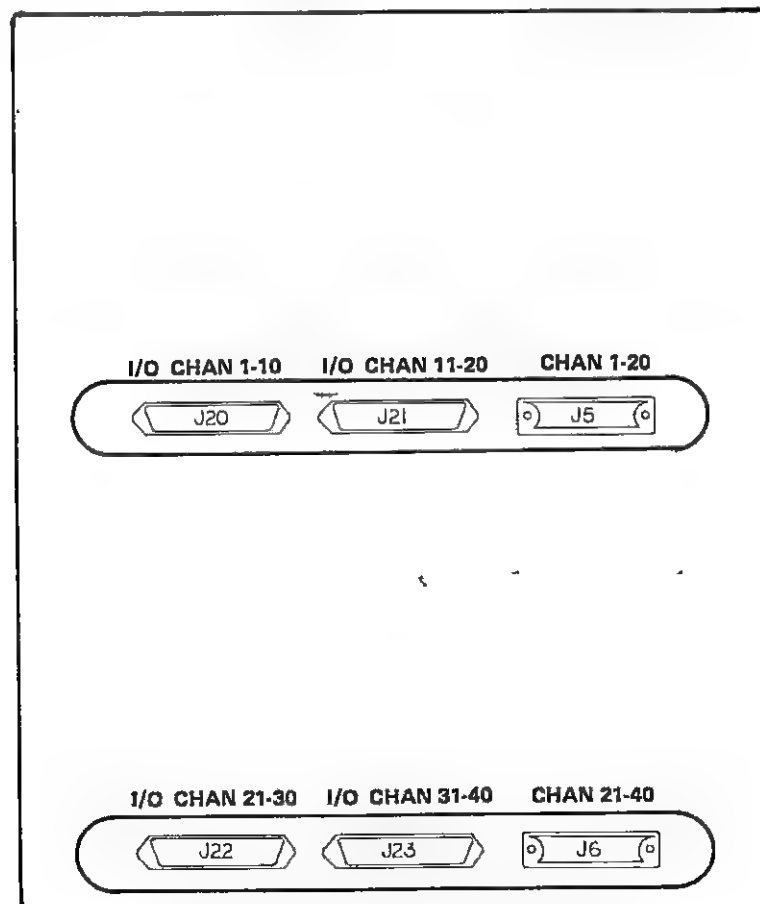
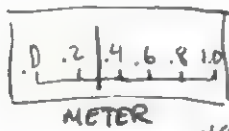
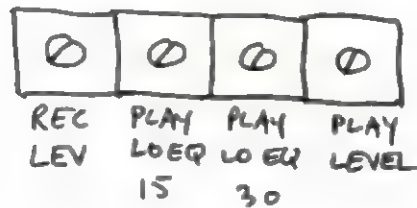


Figure 3-6. 40-Track Sync Panel, Rear Connectors

INSIDE METER PANEL



POWER

① 15

30 ips

SYNC

② 30

③ SCAN

SCAN

PRE

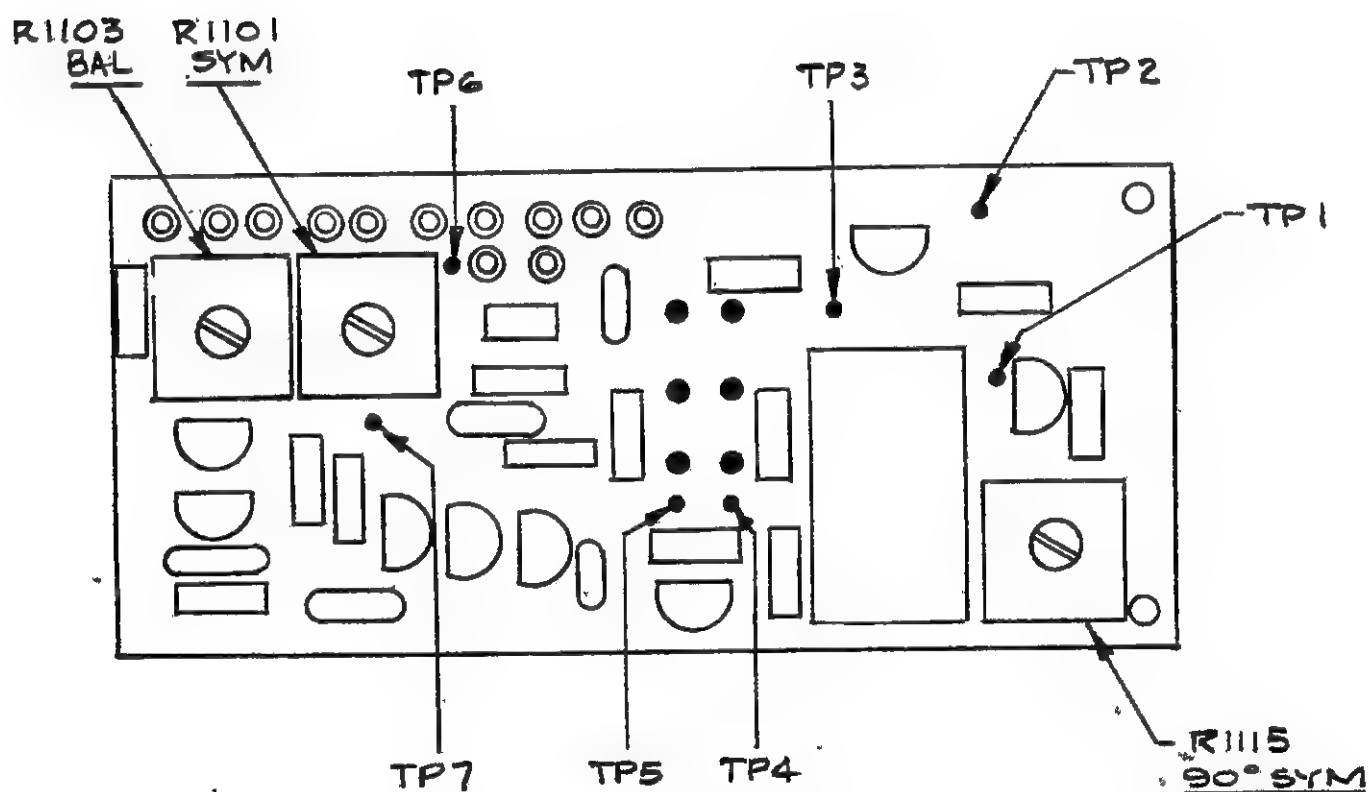
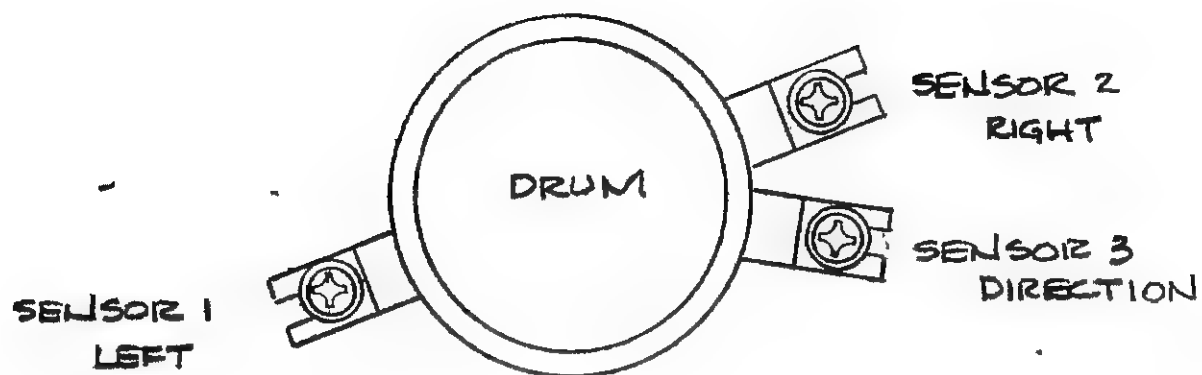
TO SET SPEED (IF TAPE SPEED WAVERS), PUT MACHINE AT DESIRED SPEED, VSO SWITCH IN NORMAL, MACHINE IN PLAY, AND ADJUST APPROPRIATE SCREW SO THAT METER STOPS WAVERING. THIS RANGE WILL BE ABOUT .2 to .8. IF MACHINE IS RELATIVELY COLD, SET BETWEEN .3 and .4. IF WARM, .5 OR SO.

NOTE THAT METER WILL WAVER UNTIL SCREW FINDS THE PROPER RANGE. AS LONG AS THE NEEDLE IS NOT STEADY, YOU HAVEN'T MOVED THE SCREW FAR ENOUGH.

Set PLAY LEVEL with 1000 cycle TONE

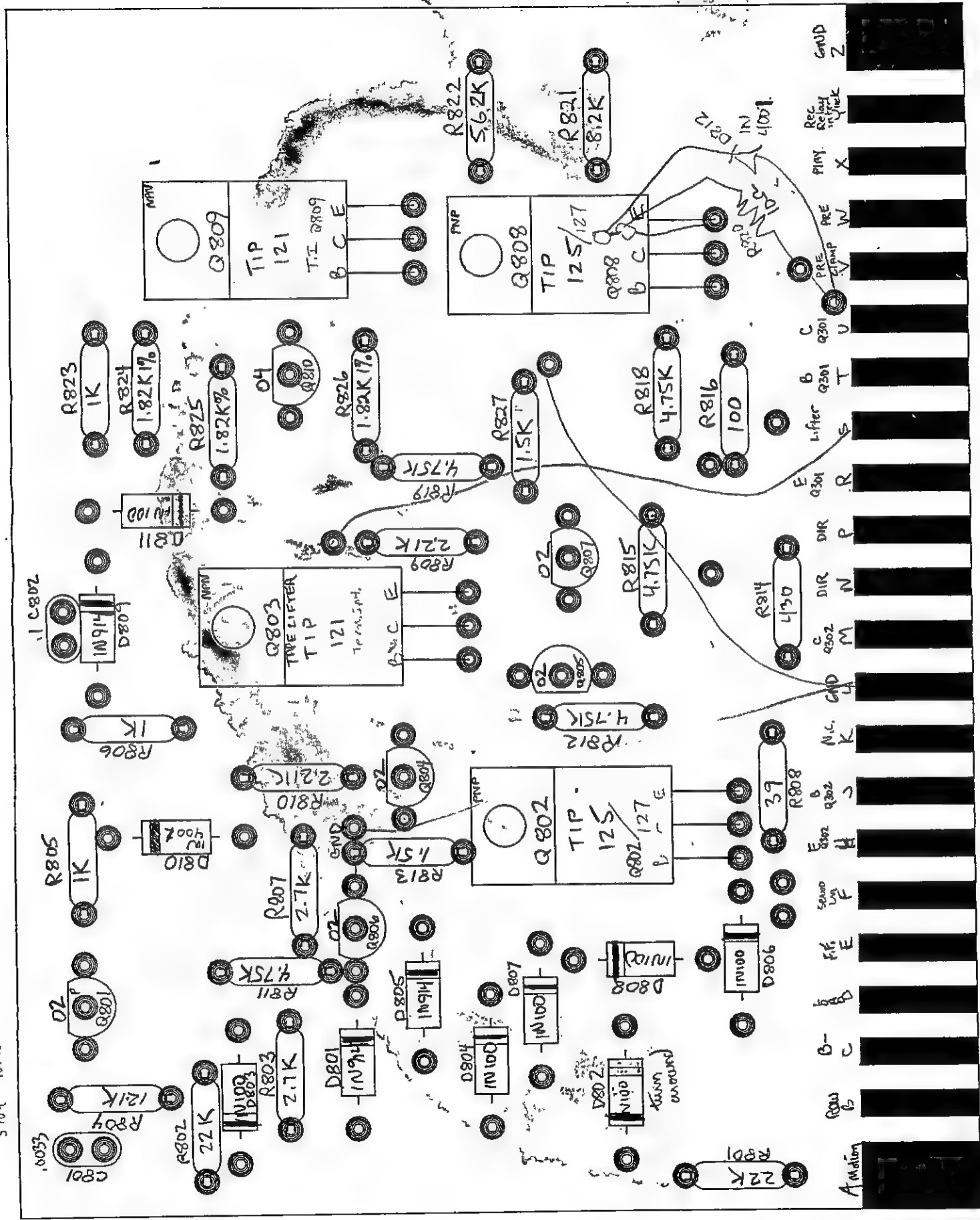
Set REC LEVEL with 1000 cycle TONE Put machine in Record (no input on) oscillator on Patch bay

Patch oscillator to tape in



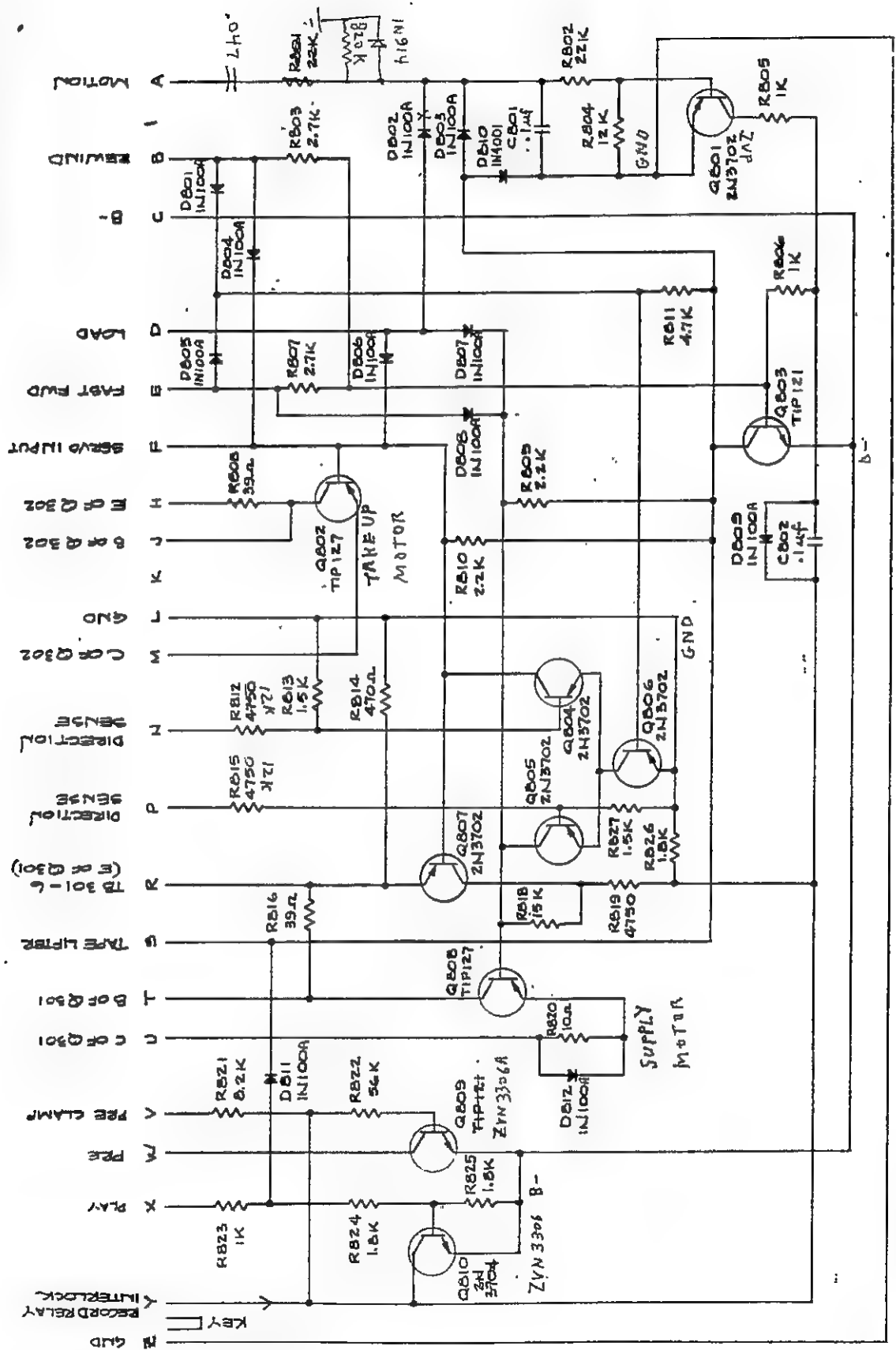
5704 - NPN

5704 - NPN



REVISIONS

REV	DESCRIPTION	DATE	BY
1	Q801 WAS .005UF, MODEL WAS B418	1-25-51	B-C-002



ALL CAPACITORS .005UF AND IN MICROFARADS
ALL RESISTORS 1/4 WATT



STEPHENS ELECTRONICS, INC.

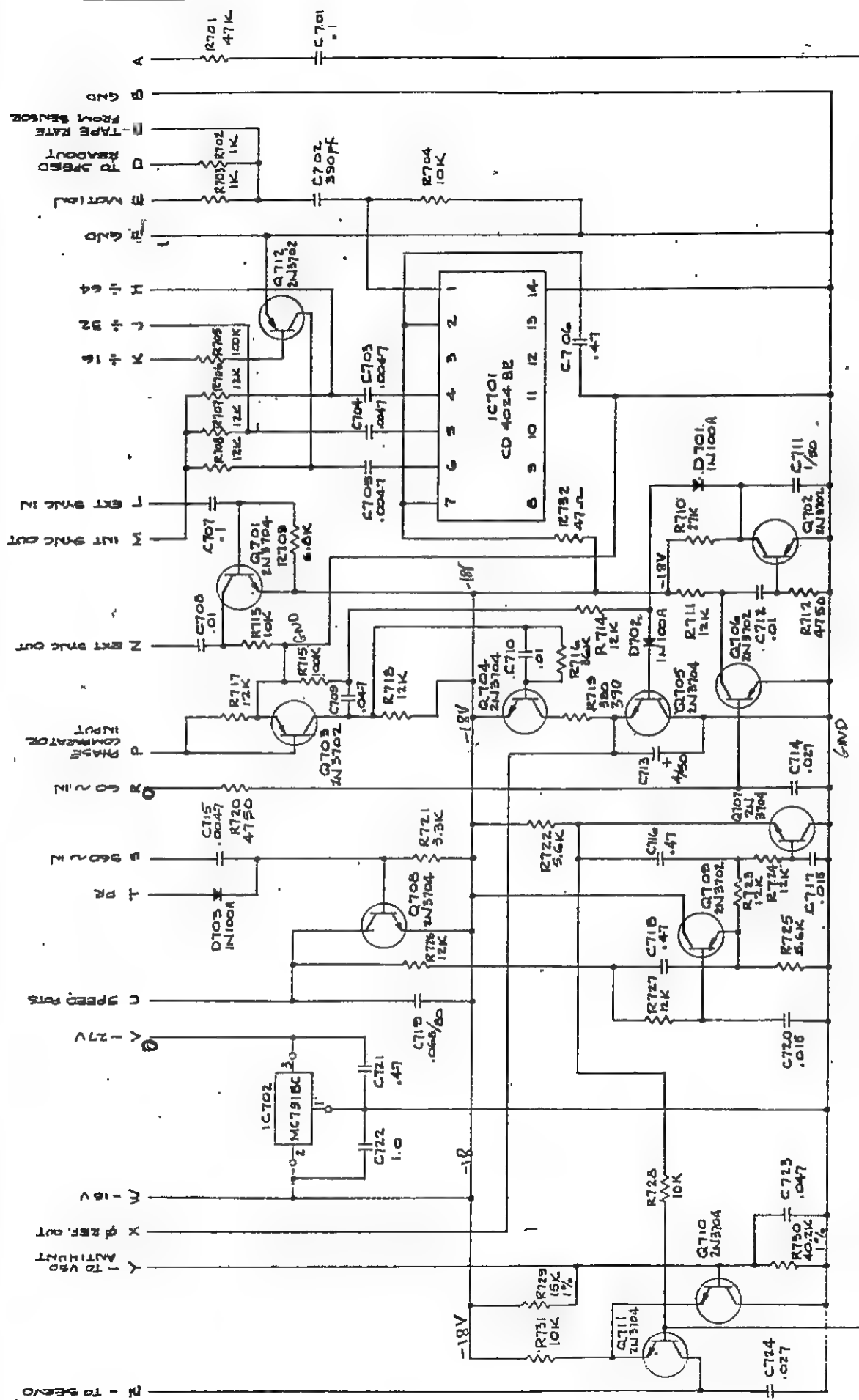
DESIGNED BY	DATE	BY
APPROVED BY	DATE	BY

SERVO CARD - 310163 A

MODELS 108A-104A FIGURE 6-12

SC-0801A

LAST 5YM	NO. USED	OMITTED
C802		
Q810		
R827		



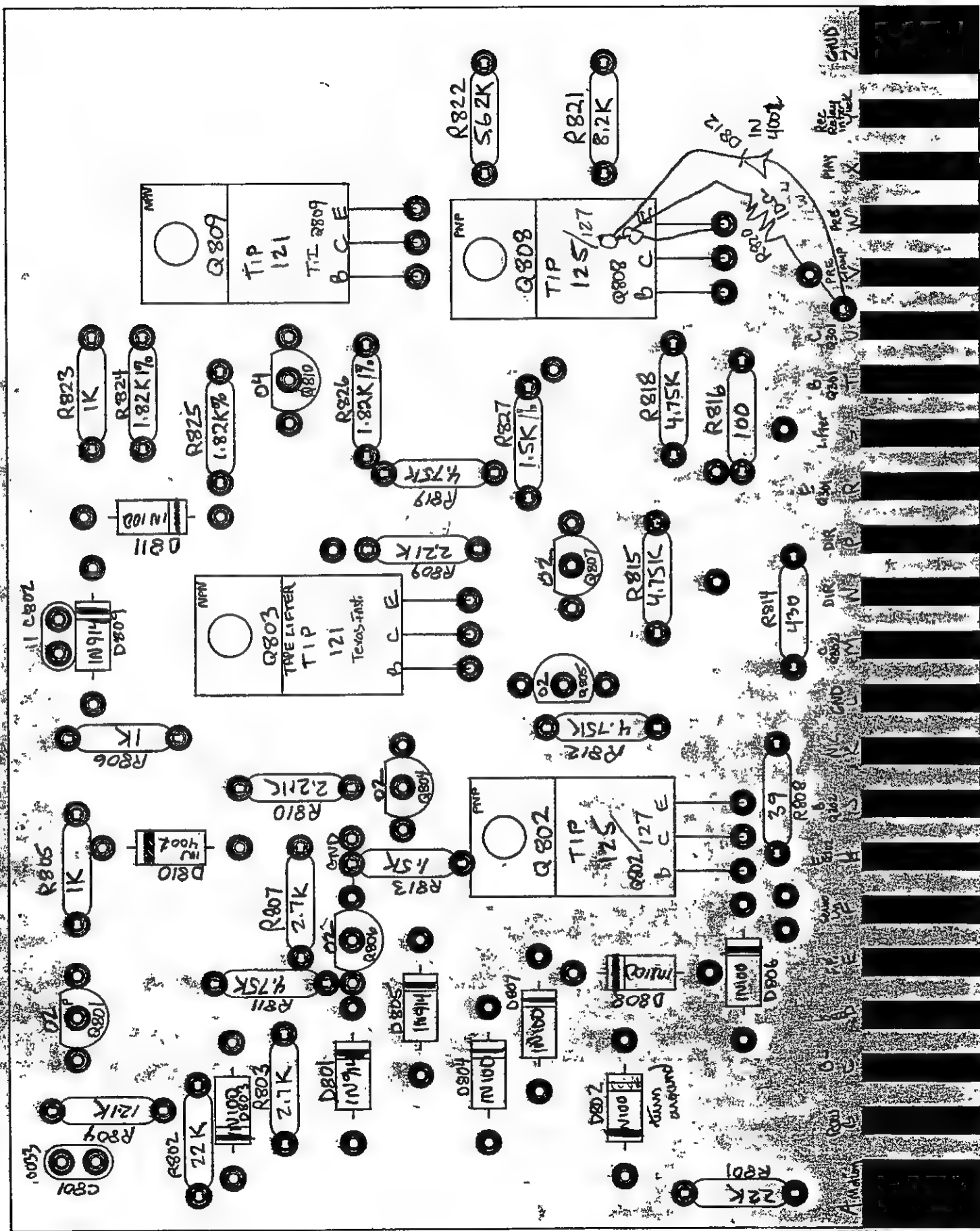
ALL CAPACITANCES 50VOLT AND IN MICROFARADS
ALL RESISTORS 1/4 WATT

STEPHENS ELECTRONICS, INC.

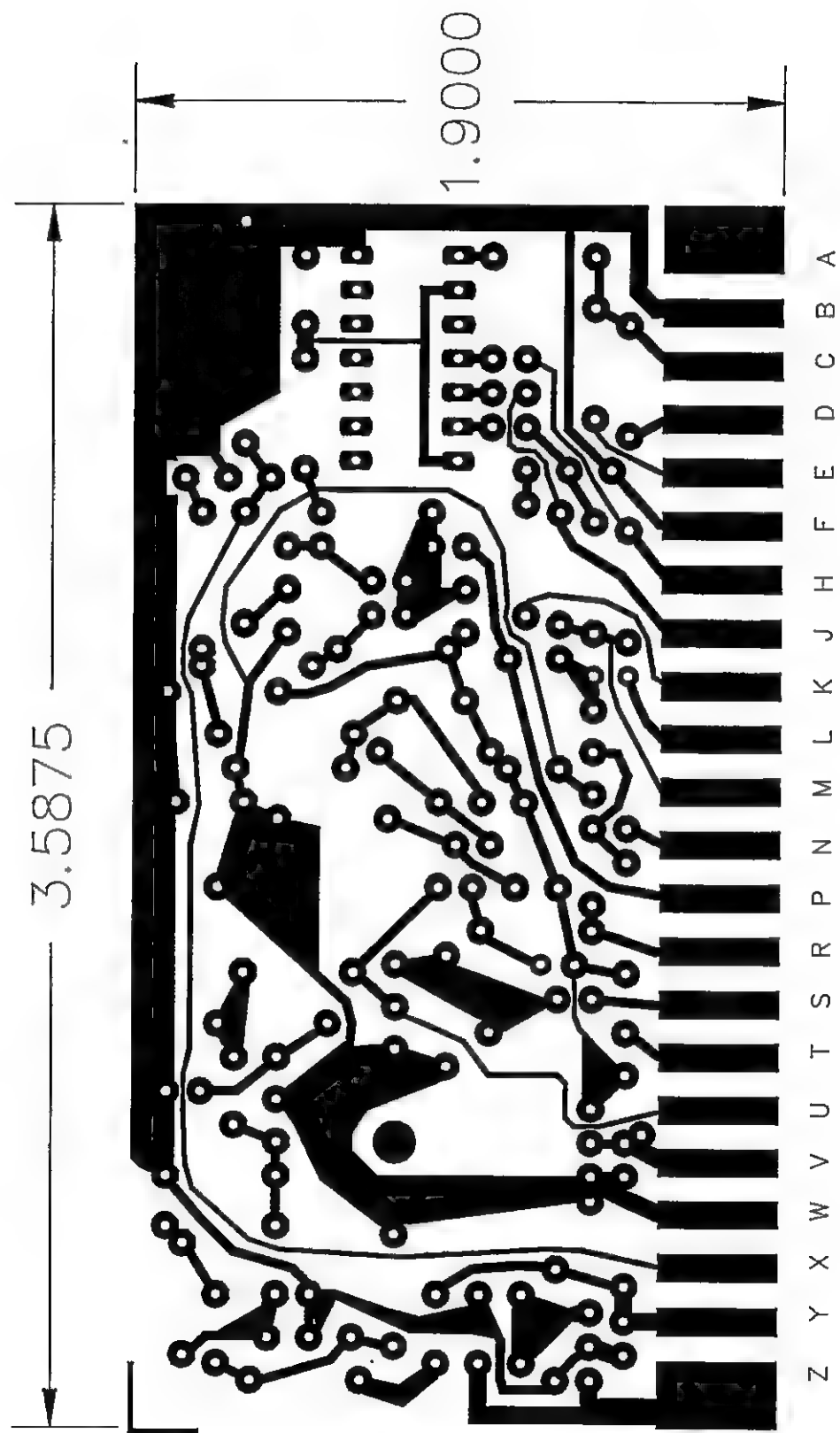
SCALE	APPROVED BY	DATE	REVISED
17 APR 78	CELE	17 APR 78	8-23-80
SCHEMATIC			
CONVERTER CARD - 310164-A			
MODELS	DATE	BY	REVISION
17 APR 78	CELE	17 APR 78	8-23-80

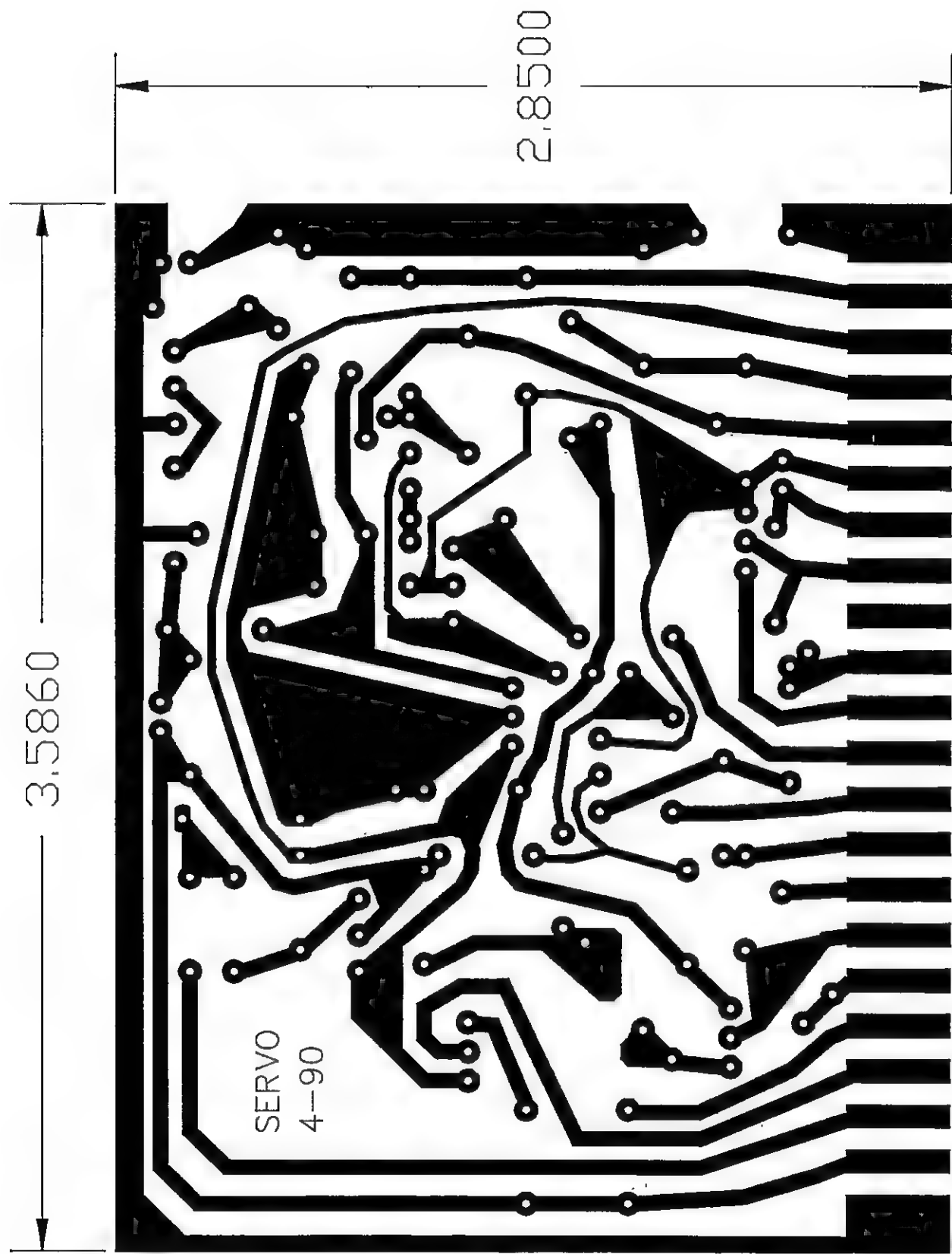
364UD

3704 - NPN



SOLDER SIDE





SERVO PCB
SOLDER SIDE

35

JD-8 B25
LIGHT GND.

JD-2 B24
YELLOW LIGHT BUSS

B16,D16,F16,H16
SEL-SYNC RELAYS

JD-2 / JD-2 / D24
SEL-SYNC BUSS

JD-5 F24
RECORD BUSS

B20,D20,F20,H20
RECORD RELAYS

INPUT-OUTPUT
220-1N104-Fem.
(AMPHENOL)

B6,D6,F6,H6
OUT

A1,C1,E1,G1
IN

A5,C5,E5,G5,B10,D10
F10,H10,A15,C15,E15,G15
GND.

-39V.
H24

PRELIM.
PC E25
GND

104

YELLOW

W/BLK

W/YEL.

W/SRY-
IN4001

W/V10.

RED

IN4001

1-∞
2 PB
3 INPUT
4. PB
} RECORD

4300

4 CHAN.
LINE AMP.
CHASSIS

H7,E8
D7,B5

G10,E10
C10,A10

H13,F13
D13,B13

H1,E2
D1,B1

INSO2-Fem

F13,5,7,9,11,E12

GND

PRE

III. AC E6 - Even
BD FH - odd

502

R1
21.5K

R2
3.6K

VU

AMPHENOL
CONNECTOR
TYPE
57-40500

INPUT 35-38

OUTPUT 43-46

INPUT GND.
10-13

OUTPUT GND.
18-21

STEPHENS ELECTRONICS

SCALE:

APPROVED BY:

DATE: 5-30-75

DRAWN BY DMS

REVISED 8-26-80

SEL-SYNC PANEL 811D

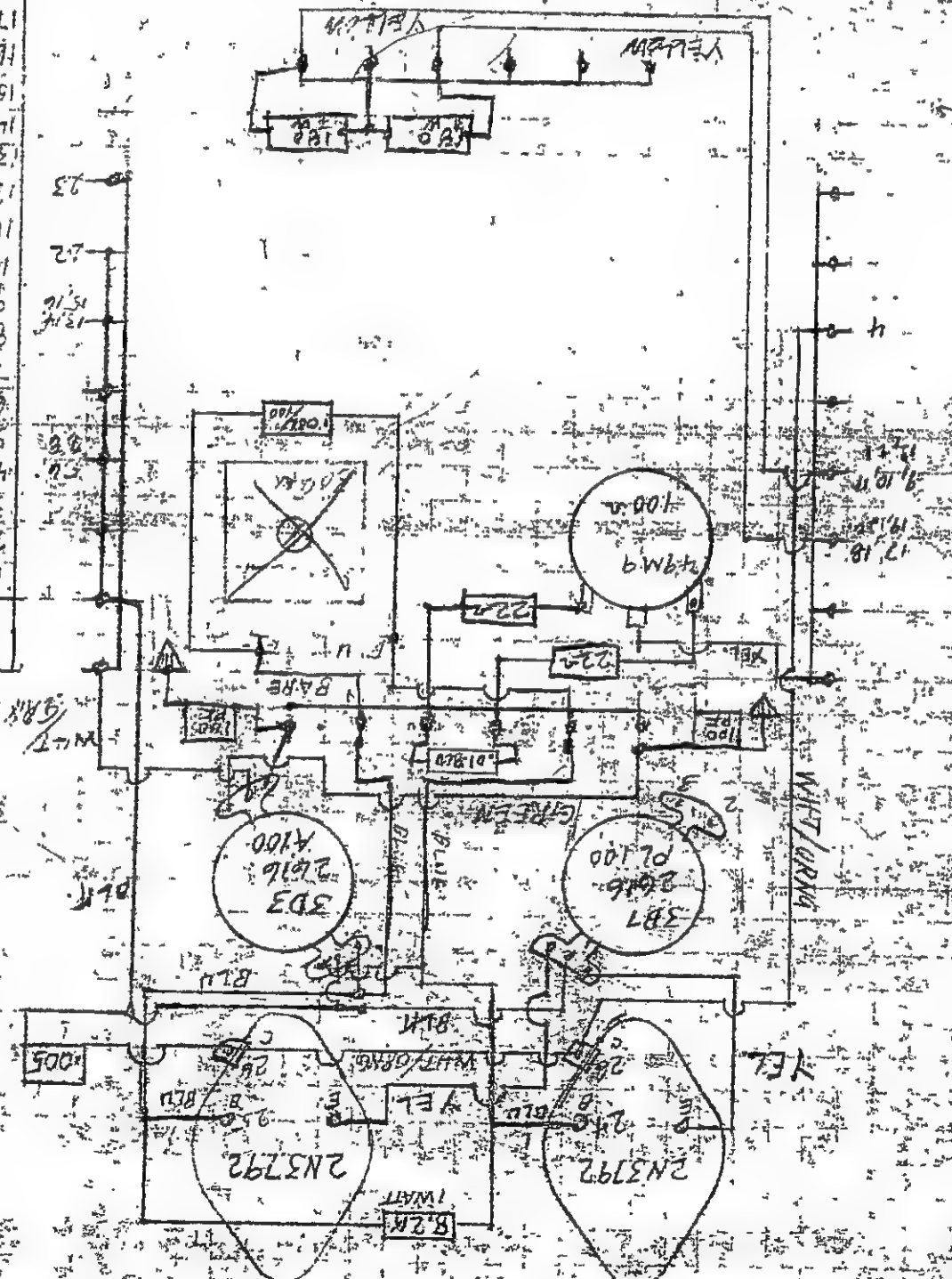
TRACKS 1-4

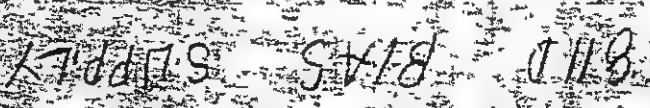
DRAWING NUMBER

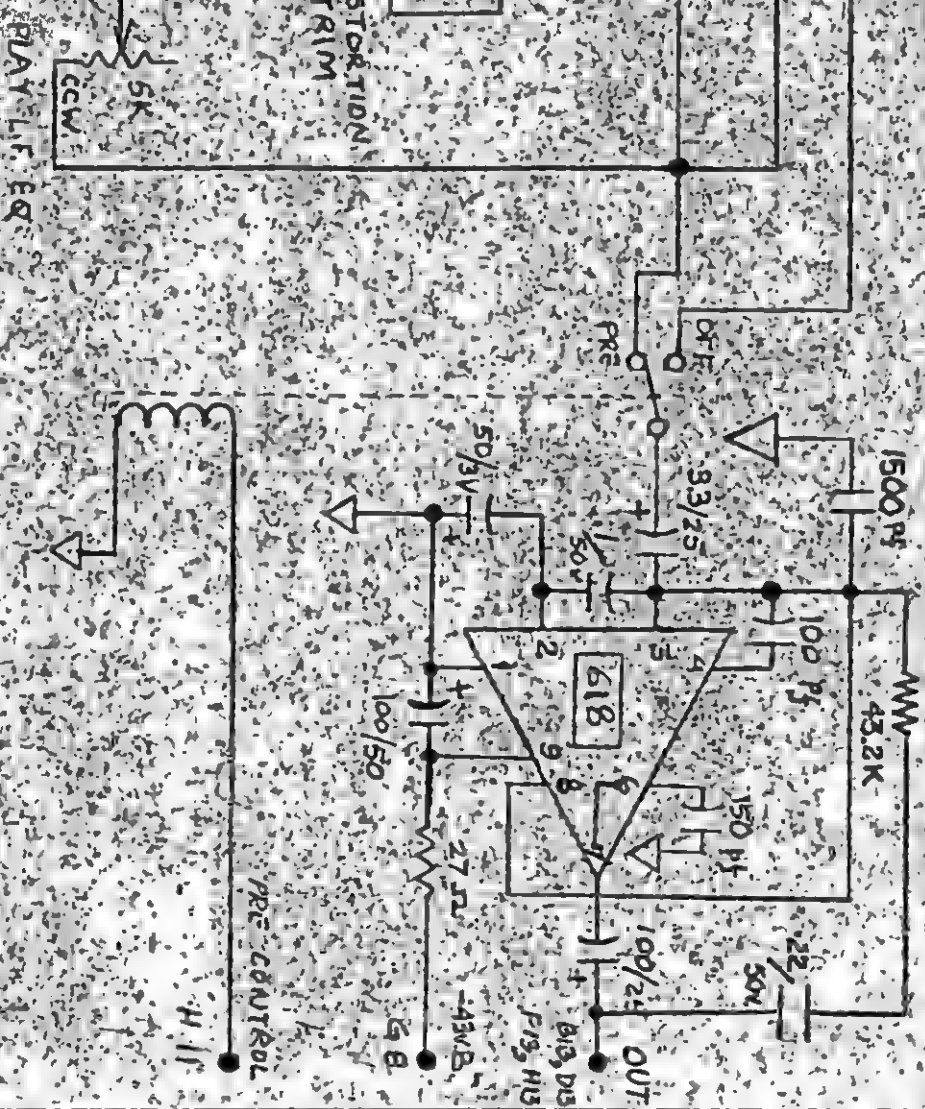
110508

- BIAS CONNECTOR
WIRE CODE
1. VIOLET - H 11.
 2. WHITE - B 0 F - H - 13
 3. WH/BK - A - 12
 4. BLUE - B - 11 K
 5. BLACK - A - 10
 6. BLACK - C - 10
 7. BLACK - E - 10
 8. BLACK - G - 10
 9. CRANG - B - 9
 10. CRANG - D - 9
 11. CRANG - F - 9
 12. CRANG - H - 9
 13. BLACK - A - 8
 14. BLACK - C - 8
 15. BLACK - E - 8
 16. BLACK - G - 8
 17. YELLOW - B - 7
 18. YELLOW - D - 7
 19. YELLOW - F - 7
 20. YELLOW - H - 7
 21. WH/YL - A - 6
 22. RED - B - 1
 23. BROWN - D - 1
 24. WHITE - F - 1
 25. WHITE - C - 1

USED IN SLAVE





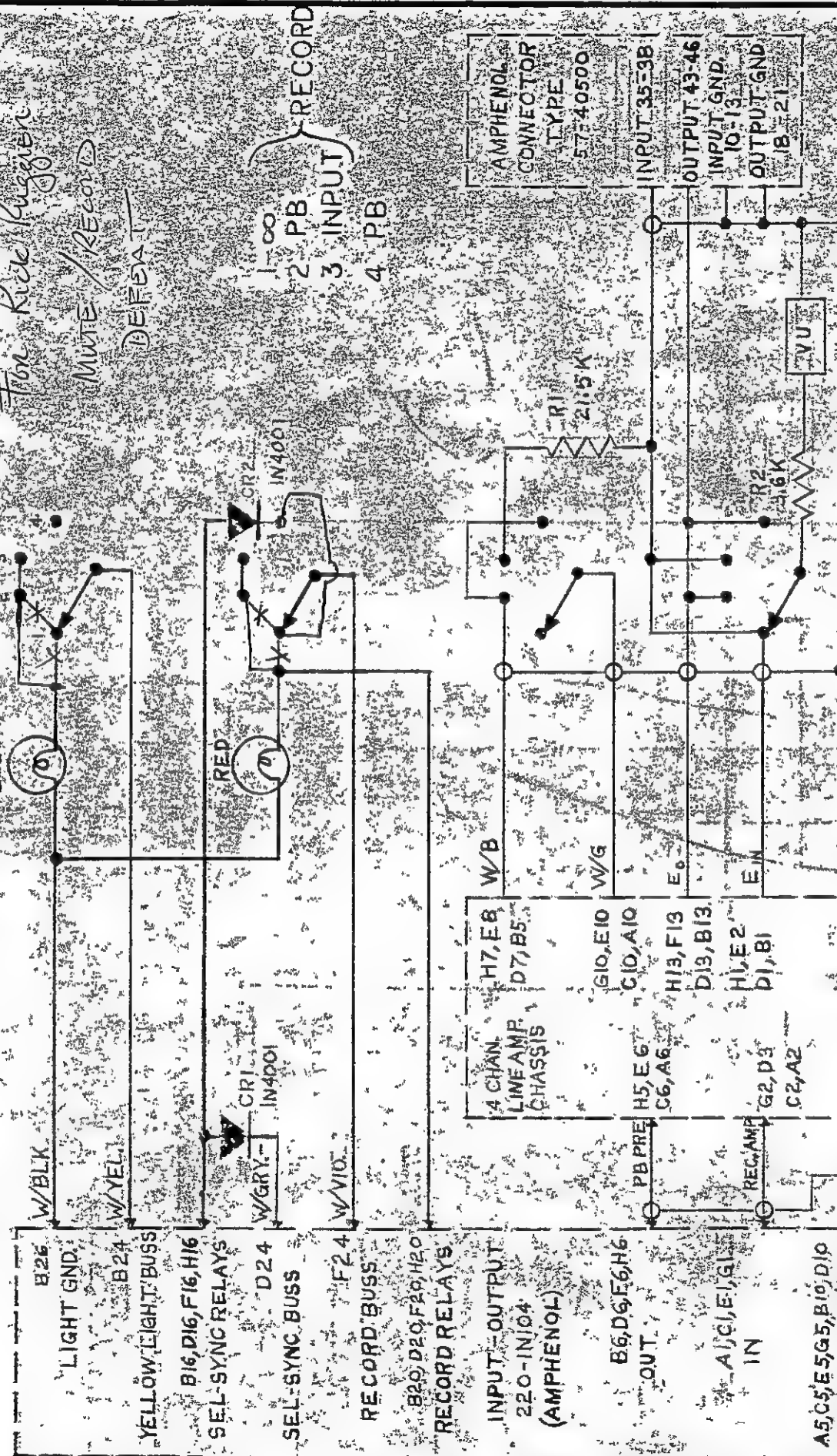


- STEPHENS ELECTRONICS INC

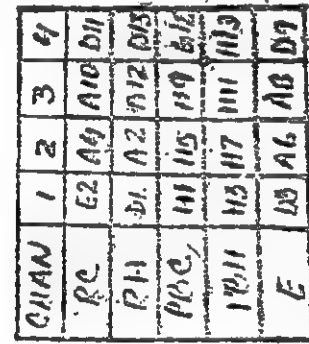
4300 LINE AMPLIFIER CARDS
FOR 811-B ELECTRONICS

DRAWING NUMBER
110932

For Rice Puggier
 MUTE / RECORD
 DEFECT



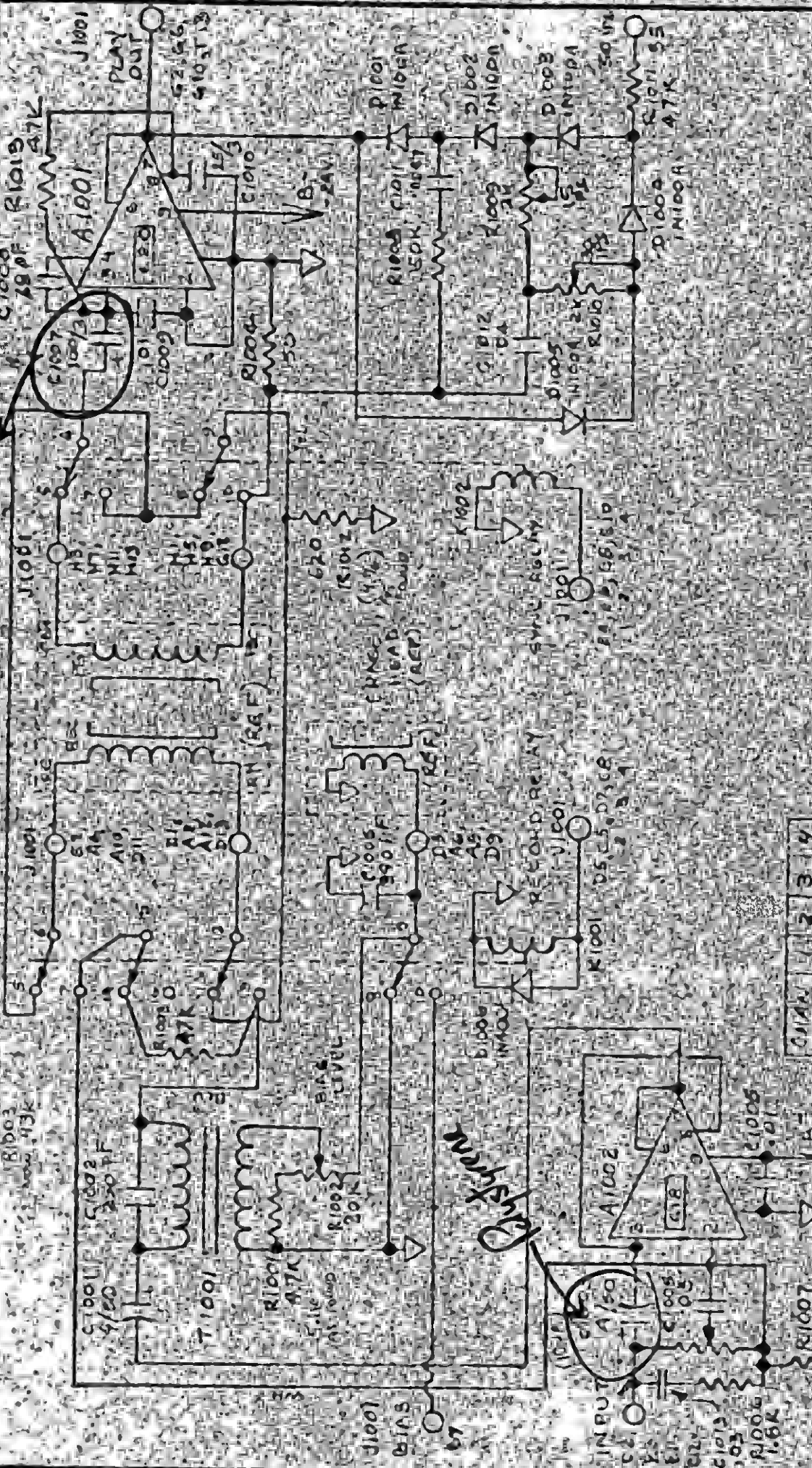
STEPHENS ELECTRONICS		SCALE	APPROVED BY:	DRAWN BY DMS
		DATE 5-30-75	<i>P. G. G. G.</i>	REVISED 8-26-80
SEL-SYNC PANEL 811D		DRAWING NUMBER 110508		



AMPHIPHILIC COMPOUNDS
IN ALCOHOLS
WIRING SIGNAL

STEPHENS ELECTRONICS INC.		PRODUCERS WORKSHOP MODIFICATION	
COPIES: --	APPROVED BY:	DESIGNED BY:	DRAWN BY:
DATE: 6/6/75	HIGH BIAS FREQ 250 KHz.	DATE: 6/6/75	DATE: 6/6/75
PRE AMP ELECTRONICS		9/20	
9/11-10		9/11-10	

INSTRUMENT CORD OR CABLE



STEPHENS ELECTRONICS INC	
DATE: 8/6/75	APPROVED BY:
DRAWN BY: JEL	
REVIEW: JEL	
160 AMP ELECTRONICS	
811-D 3100	
DRAWING APPROVED: 110912-C	

CHAW	4	3	3	4
PC	52	74	A12	D1
PH	51	A2	A2	D2
PBC	51	H5	H9	H12
PBM	45	H7	H11	H13
E	23	A6	H8	D7

APPENDIX CONTAINING
PIN NUMBERS
FOR ALL IC'S

A10, E10, E10, A10
 10 SEL SYNC SWITCH FOR OUT. RUM SELECT

B5, D7, E8, H7

PLAY INPUT

A6, A6, E6, H5

10 REC AMP

A2, C3, D3, G2

REC INPUT

B1, D1, H1, E2

30 IPS CONTROL IN

G12

30 IPS

1005

8.2K

4.7K

1.4

50

100K CM

REC LEVEL

25K

CM

100K CM

DISTORTION

PRIM

5K

CM

PLAY L.H. EQ

50/3V

10/25

50V

150 pF

10/25

50V

150 pF

27K

100/50

4.8

8

35/25 OUT

B13, H13

PRE

OFF

50/3V

100/50

27K

100/50

4.8

8

35/25 OUT

B13, H13

PRE

OFF

50/3V

100/50

27K

100/50

4.8

8

35/25 OUT

B13, H13

150 pF

10/25

50V

150 pF

27K

100/50

4.8

8

35/25 OUT

B13, H13

PRE

OFF

50/3V

100/50

27K

100/50

4.8

8

35/25 OUT

B13, H13

PRE

OFF

50/3V

100/50

27K

100/50

4.8

8

35/25 OUT

B13, H13

150 pF

10/25

50V

150 pF

27K

100/50

4.8

8

35/25 OUT

B13, H13

PRE

OFF

50/3V

100/50

27K

100/50

4.8

8

35/25 OUT

B13, H13

PRE

OFF

50/3V

100/50

27K

100/50

4.8

8

35/25 OUT

B13, H13

NOTES: 1. BOTH RELAYS ARE ENERGISED

2. RELAYS ARE COMMON TO ALL CHANNELS

3. PIN NUMBERS ARE PER GREEN

AMPLIFIER CONNECTORS

4. ALL RESISTOR VALUES ARE K OHM

STEPHENS ELECTRONICS INC.

SCALE

DATE 5-20-75

APPROVED BY

DATE 5-20-75

DRAWN BY

REVISED

4500 LINE AMPLIFIER CARDS

PER 811-A ELECTRONICS

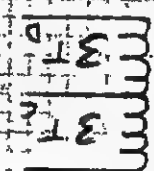
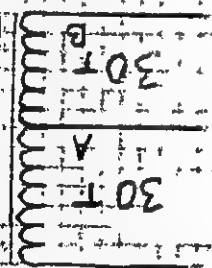
DRAWING NUMBER

110932-A

9/12/74 Randy

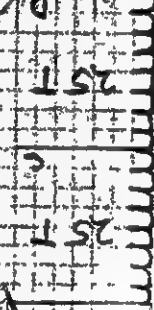
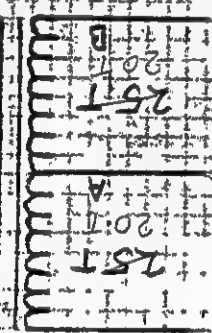
O.S.C. TRANS

30 TURNS OF #24 SOLID ENAMEL COATED WIRE BELDON #8052
 3 TURNS OF #26 SOLID ENAMEL COATED WIRE BELDON #8065
 WIND 2 WIRES AT A TIME THE 30 THEN THE 3'S
 BORDIN #2616 PCB1 SEPERATED BY TAPE
 CORE #2616P 4100-3D3



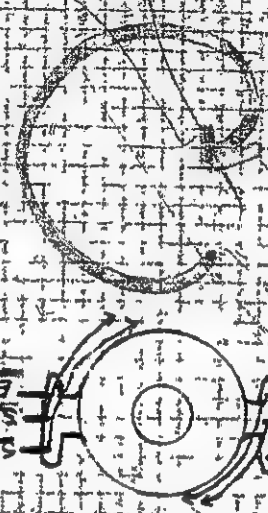
STANDARD OUTPUT - ERASE

25 TURNS OF #24 SOLID ENAMEL COATED WIRE BELDON #8052
 WIND 4 WIRES AT ONE TIME
 CUT THE 4 WIRES TO A LENGTH OF 56 INCHES BEFORE TURNING
 BORDIN #2616 PCB1
 CORE #2616 PL100 3D2



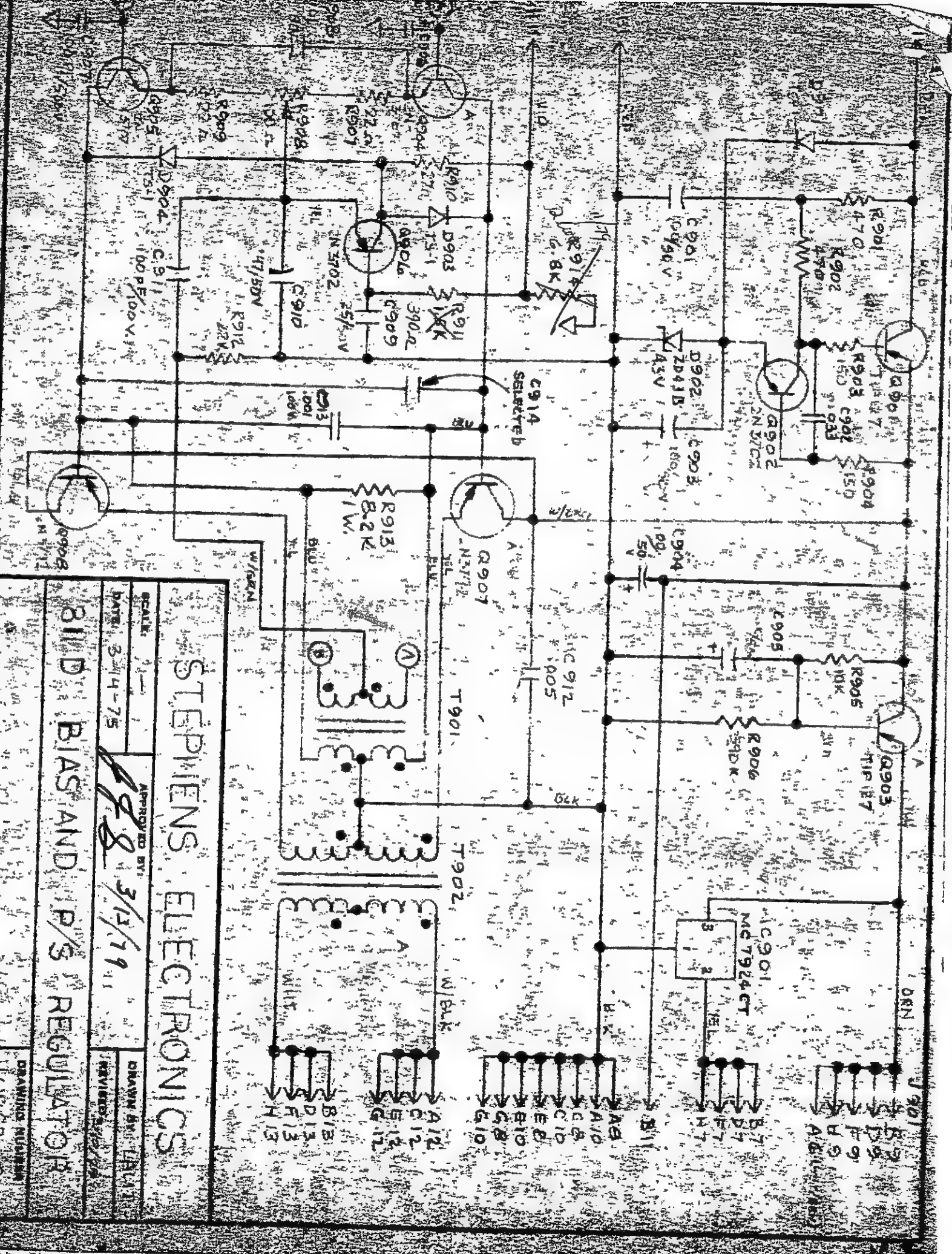
CORES AND BORDINS FROM FERROXUBE CORR

WRAP COILS WITH TAPE WHEN FINISHED AND CHECK FOR GOOD FIT IN CORES



WIND CLOCKWISE

223 223
 223 223
 223 223



STEPHENS ELECTRONICS

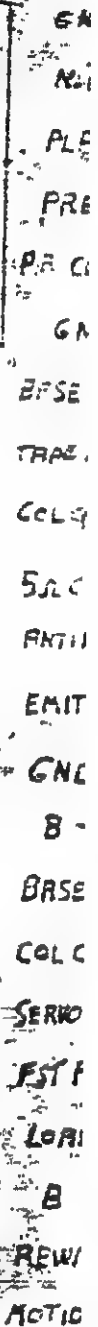
SCALE: 3-14-75

APPROVED BY: 3/13/79

DRAWN BY D.L.

811 D BIAS AND P/S REGULATOR

DRAWING NUMBER

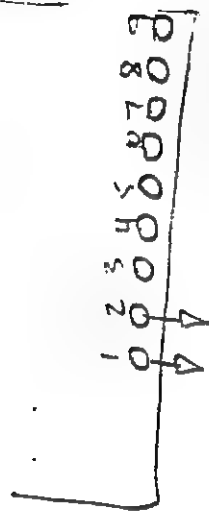


Severe Card. dx
with anti-hypert
medication + ang
Apr 16, 1977

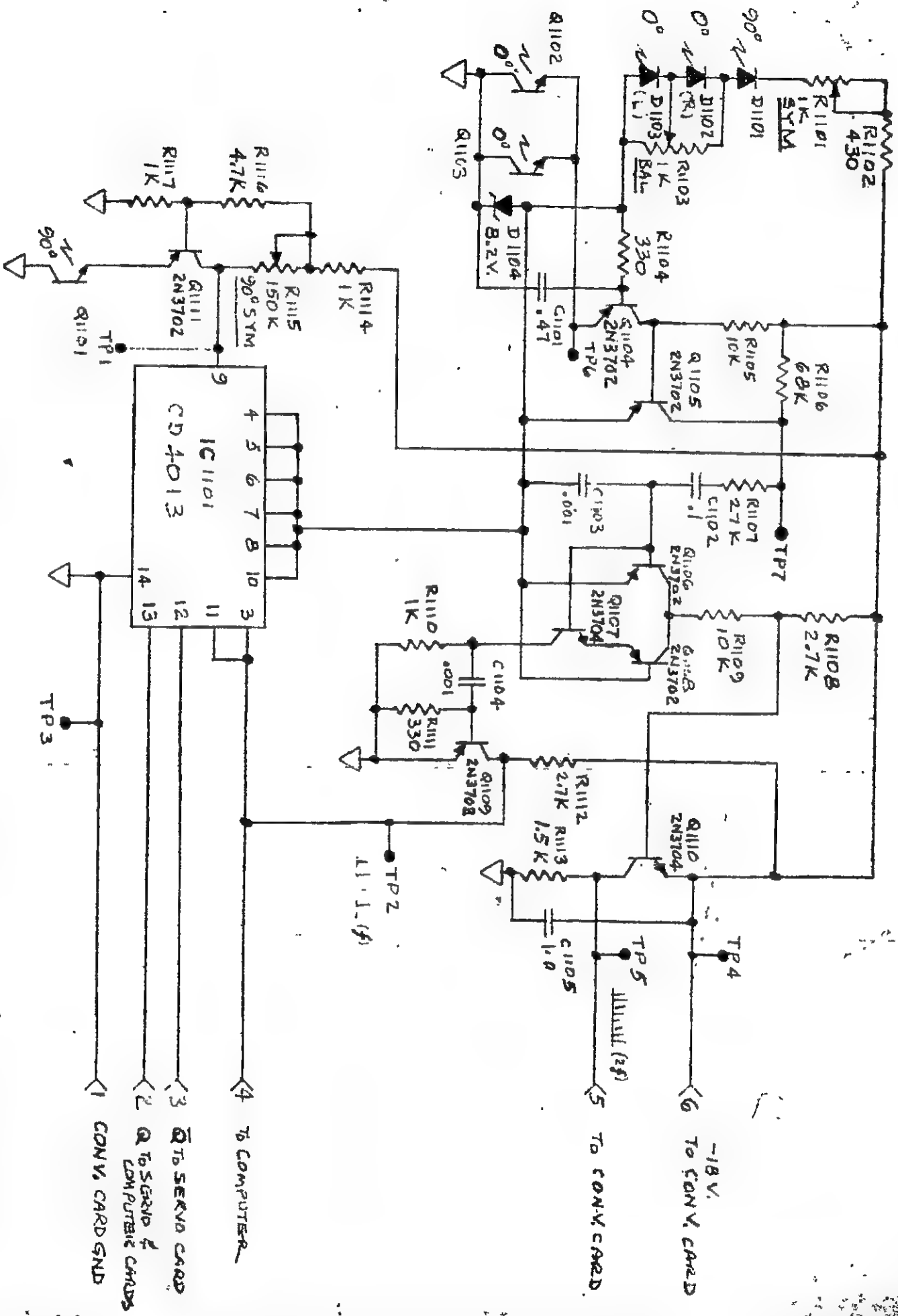
SCALE	2:1	APPROVED BY	
DATE	10/10/74	DRAWN BY	PKW
		REVIEWED	

Service Card # 310163

3/5/63



11/17/2011



SCHEMATIC, SENSOR INTERFACE CARD AND SENSORS

FIGURE 6-10

SC-1101

6/18/79 PB
ADDED FIG. 7/30/79 RB

REVISIONS			
LTR	DESCRIPTION	DATE	BY

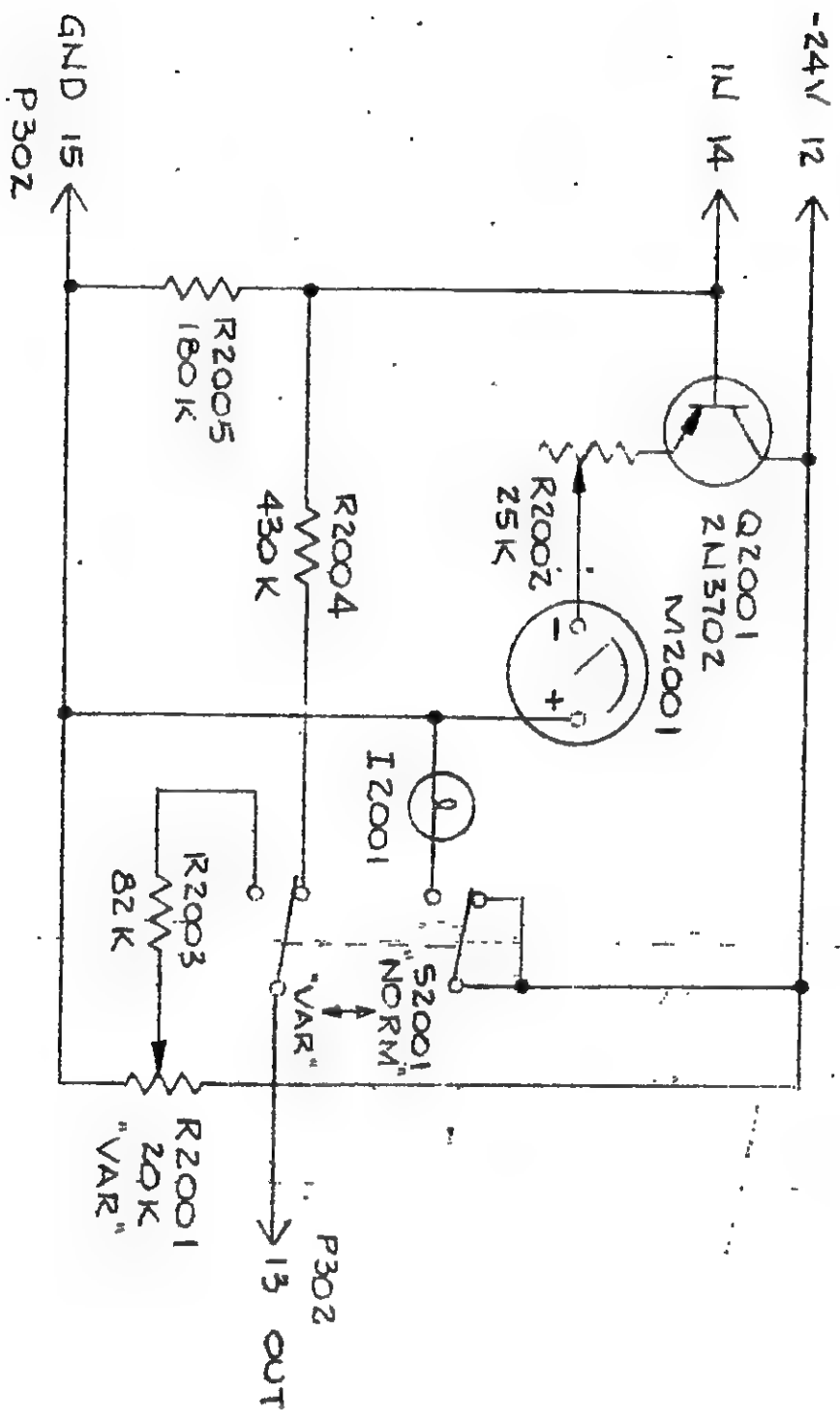


FIGURE 6-17



2N3702
BOTTOM VIEW

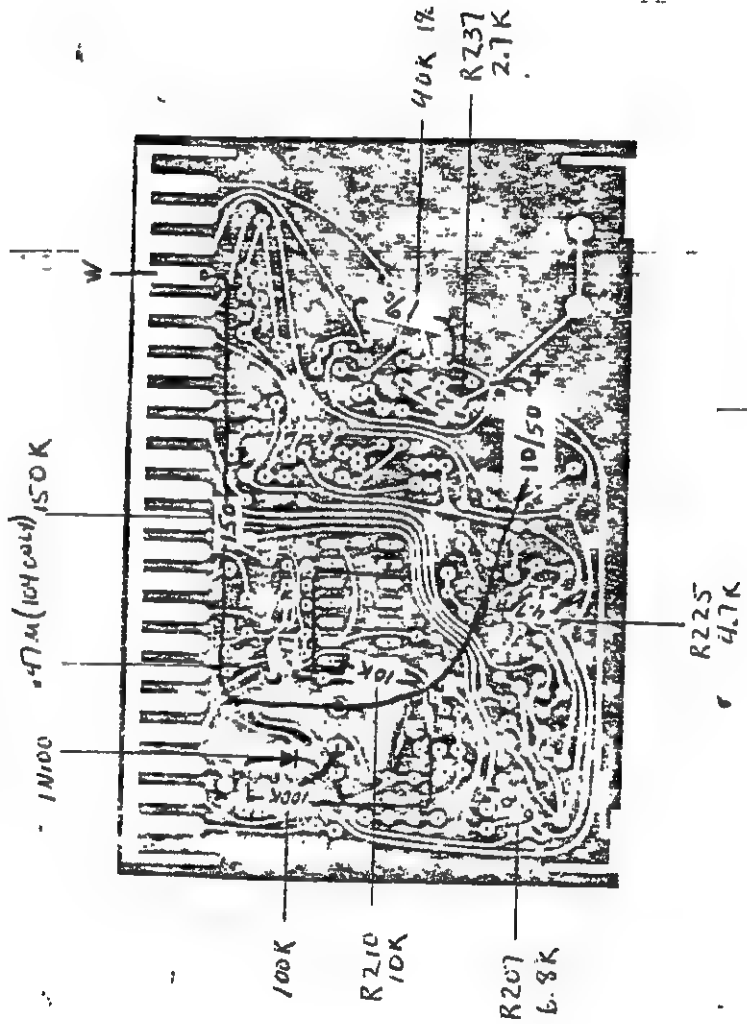
STEPHENS ELECTRONICS, INC.

VSO MODULE

SCALE: 1	APPROVED BY:	DRAWN BY: GELIER
DATE: 24 SEP 79		REVIEWED:

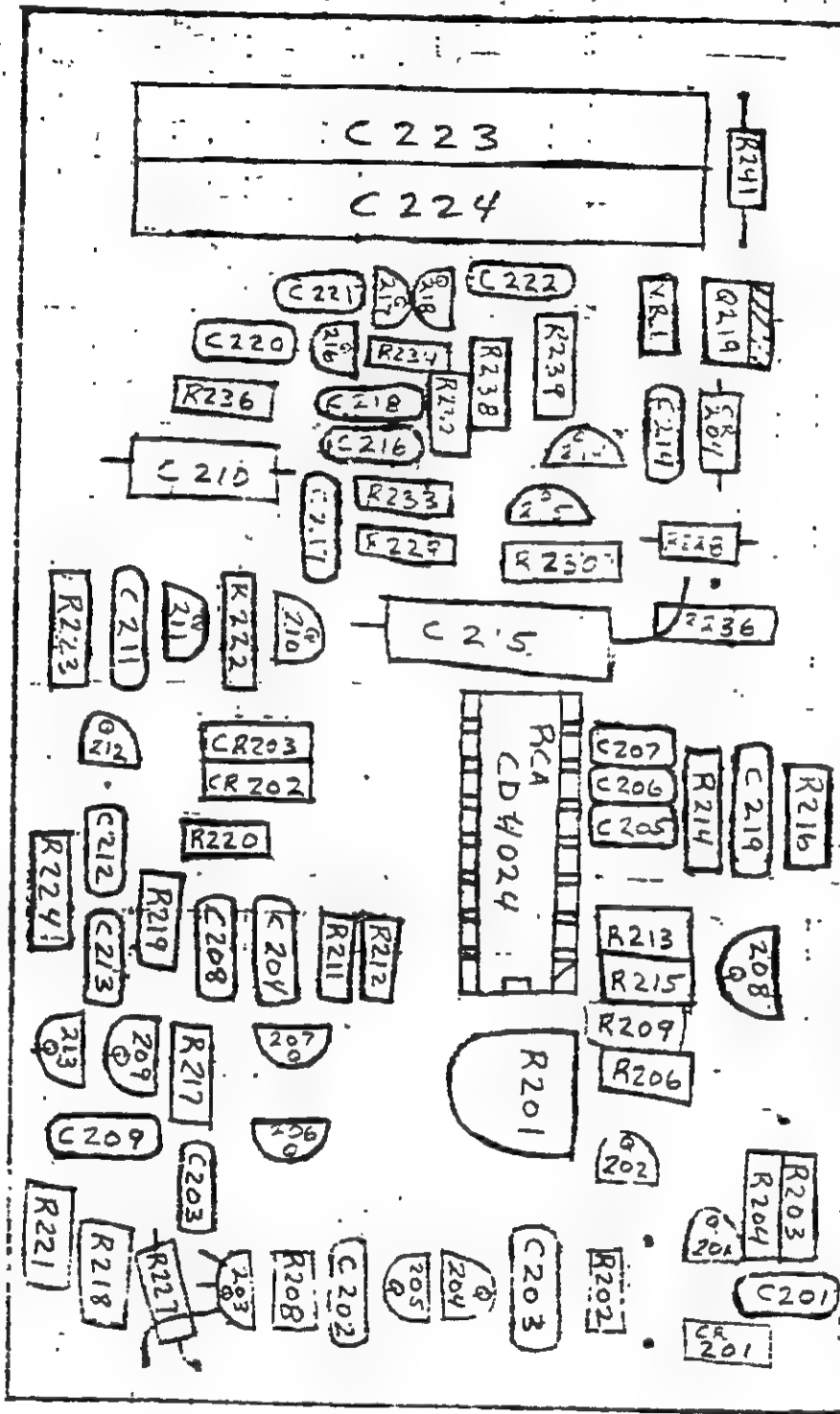
MODEL 821-B	FIGURE 6-17	DRAWING NUMBER SC-2001
-------------	-------------	------------------------

#310164



103- NO. 47M CAP
104- ADD. 47M CAP.

Z
Y
X
W
V
U
T
S
R
Q
P
N
M
L
K
J
I
H
G
F
E
D
C
B
A



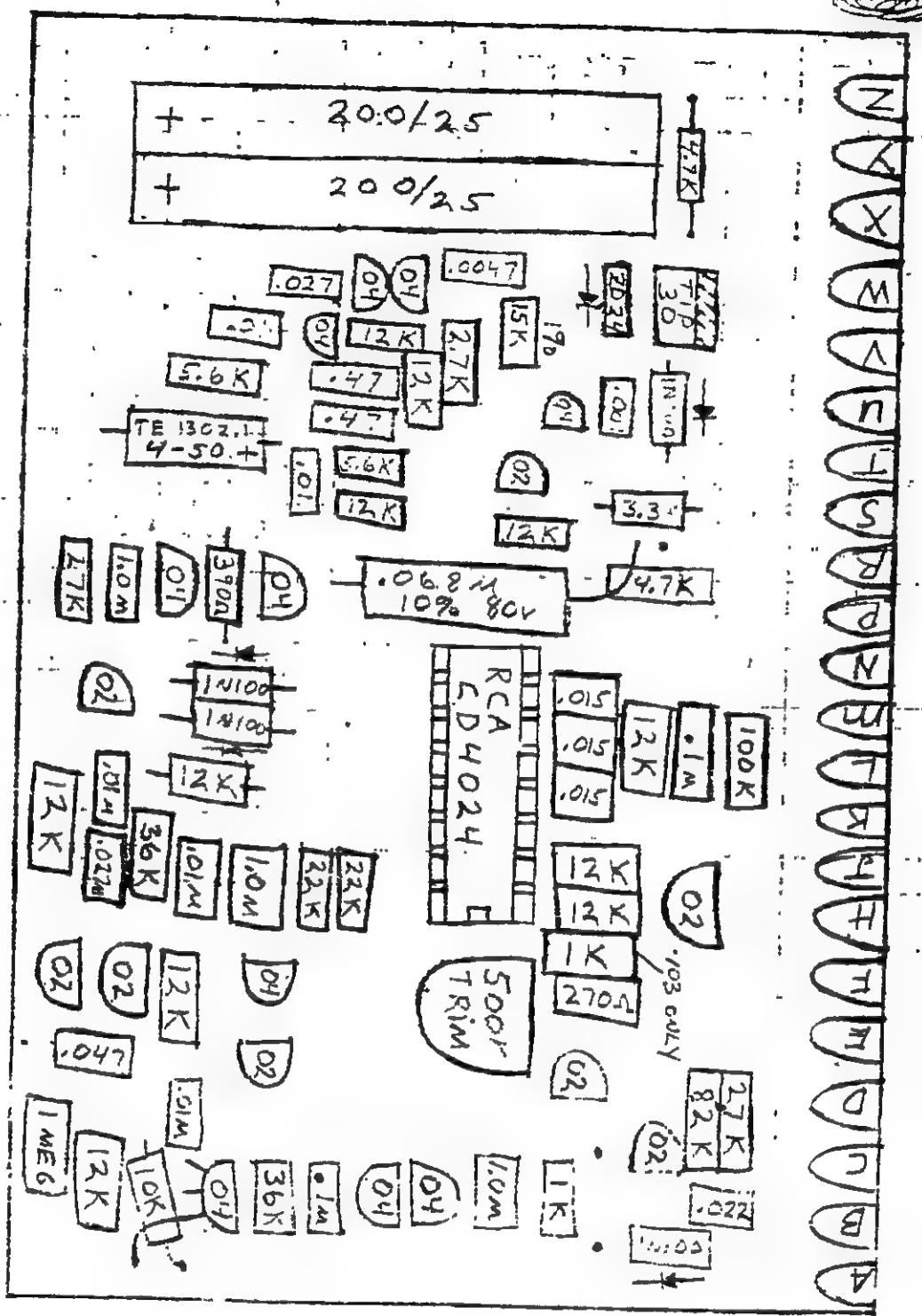
Card # 310164

211D-103-194

2/3/76
Assembly

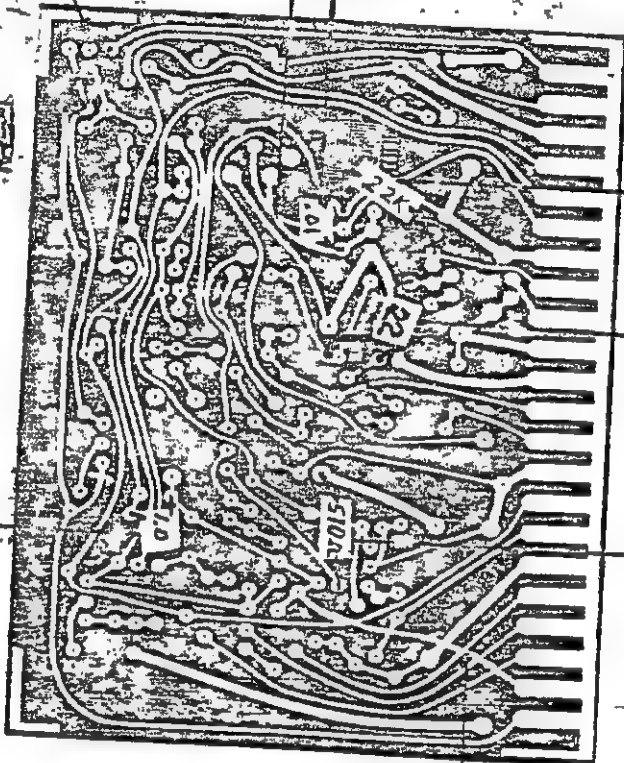
811D-103

CONFIDENTIAL



103	ADD	1K
104	NO	1K

2/3/76



ON 10-1
ADD INIOP

JUMPER

R119
22K

22K

R138
510A

C112

JUMPER

811D-105

811D-16 TAPE SYSTEM SEL SYNC

SJ10	SJ11	SJ12	SJ13	SJ14	SJR	SWITCH	CKT
					B 16		SS 1
					D 16		SS 2
					F 16		SS 3
					H 16		SS 4
					A 17		SS 5
					C 17		SS 6
					E 17		SS 7
					G 17		SS 8
					B 18		SS 9
					D 18		SS 10
					F 18		SS 11
					H 18		SS 12
					A 19		SS 13
					C 19		SS 14
					E 19		SS 15
					G 19		SS 16
					B 20		RR 1
					D 20		RR 2
					F 20		RR 3
					H 20		RR 4
					A 21		RR 5
					C 21		RR 6
					E 21		RR 7
					G 21		RR 8
					B 22		RR 9
					D 22		RR 10
					F 22		RR 11
					H 22		RR 12
					A 23		RR 13
					C 23		RR 14
					E 23		RR 15
					G 23		RR 16
			26				1
			27				2
			28				3
			29				4
			30				5
			31				6
			32				7
			33				8
			34				9
			35				10
			36				11
			37				12
			38				13
			39				14
			40				15
			41				16
			42				17
			43				18
			44				19
			45				20
			46				21
			47				22
			48				23
			49				24
			50				25
			51				26
			52				27
			53				28
			54				29
			55				30
			56				31
			57				32
			58				33
			59				34
			60				35
			61				36
			62				37
			63				38
			64				39
			65				40
			66				41
			67				42
			68				43
			69				44
			70				45
			71				46
			72				47
			73				48
			74				49
			75				50
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			82				57
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			85				60
			86				61
			87				62
			88				63
			89				64
			90				65
			91				66
			92				67
			93				68
			94				69
			95				70
			96				71
			97				72
			98				73
			99				74
			100				75

COLOR CODE

STRIPPED

(DOLBY) COLOR CODE

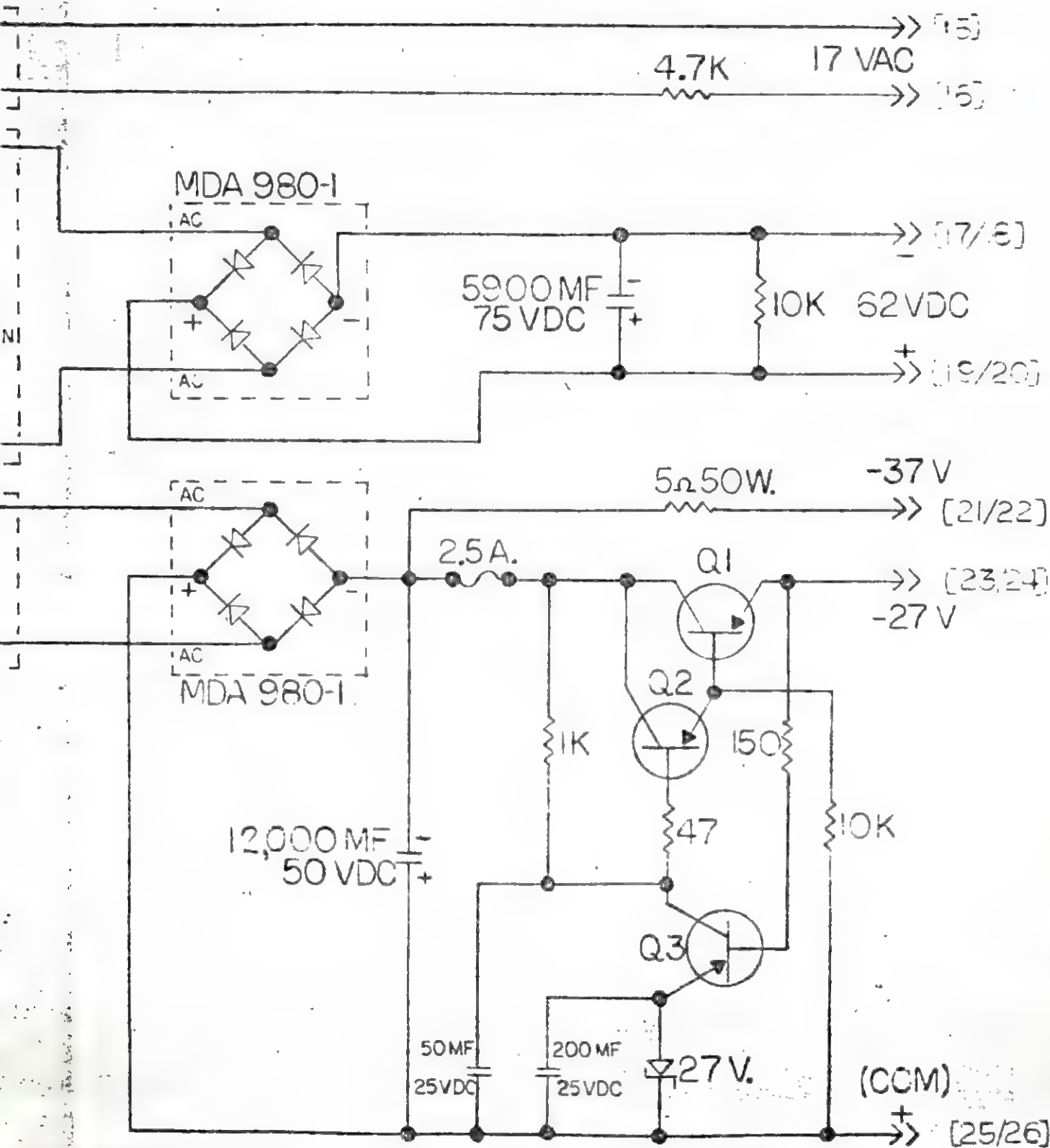
SYNC BUSS

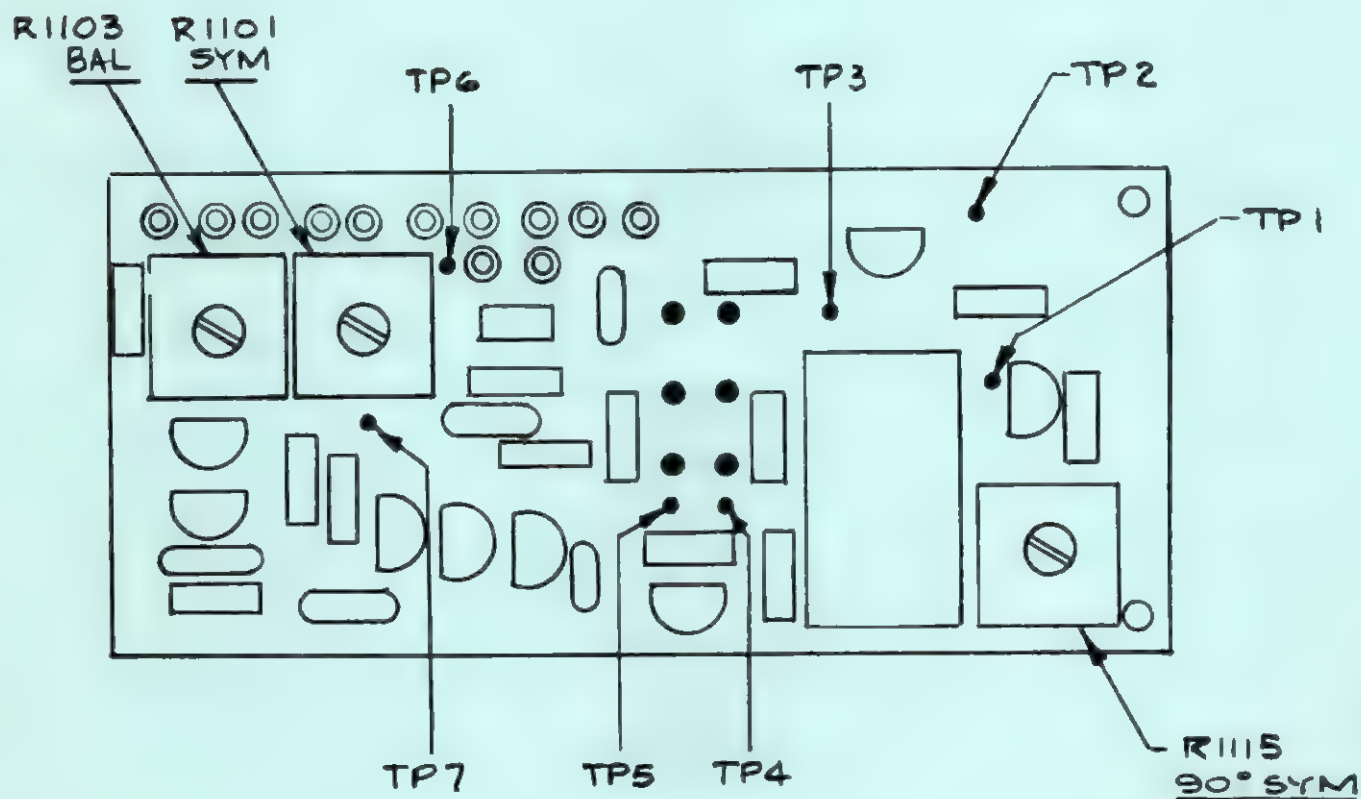
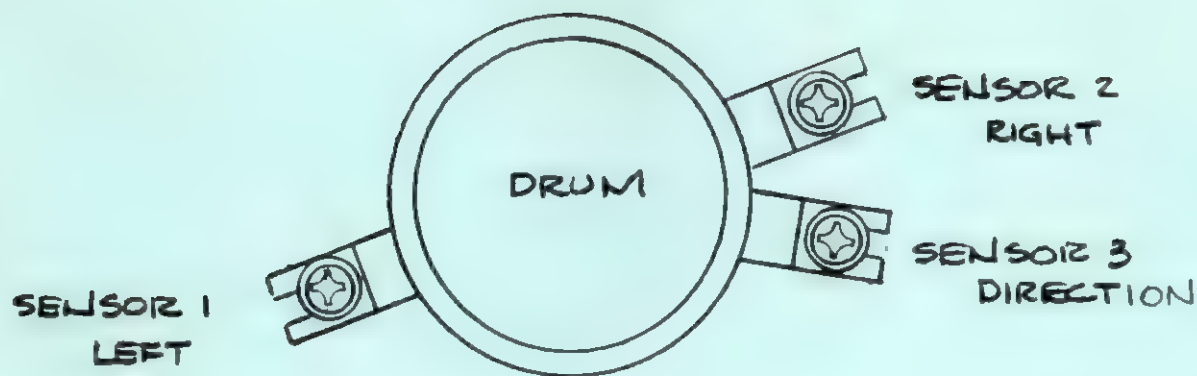
(3-4-76) 34

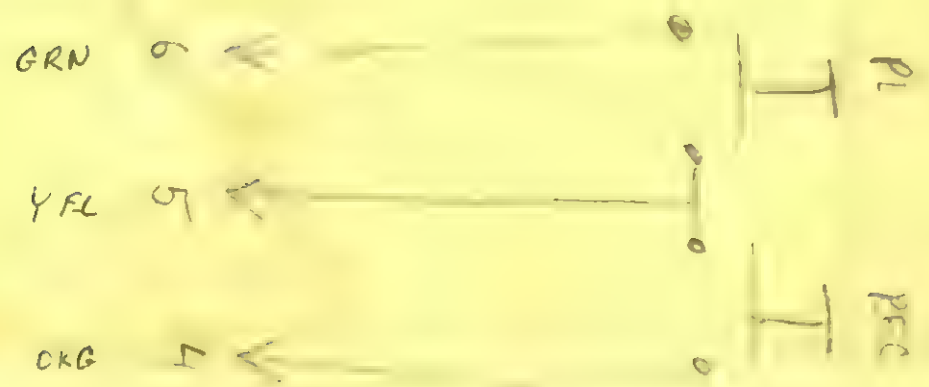
B 26 W/Blk
B 24 W/Yel
D 24 W/Yel
F 24 W/Yel

SEL
SWITCH
REAR BUSS

TAPE MACHINE POWER SUPPLY SCHEMATIC

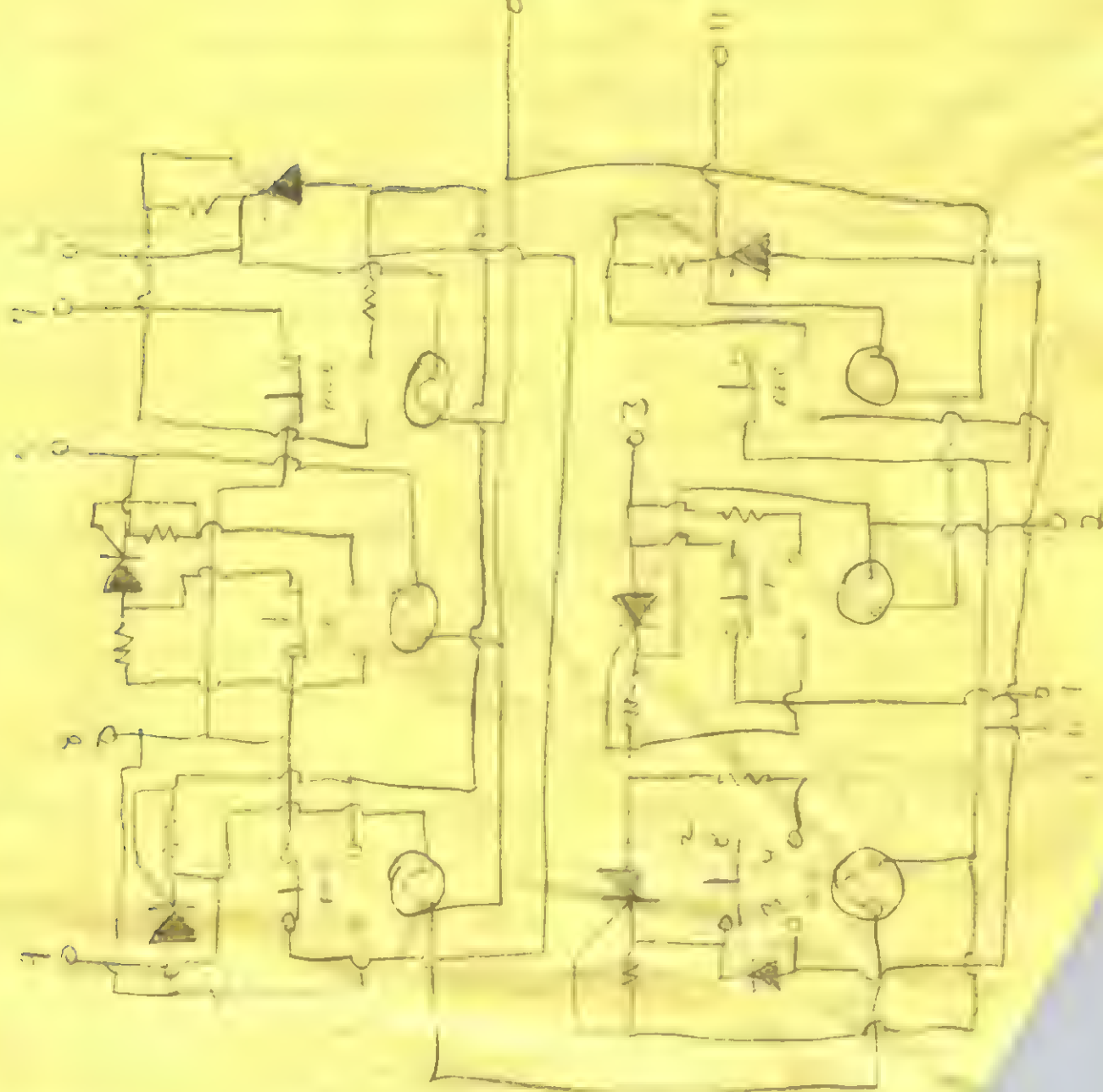




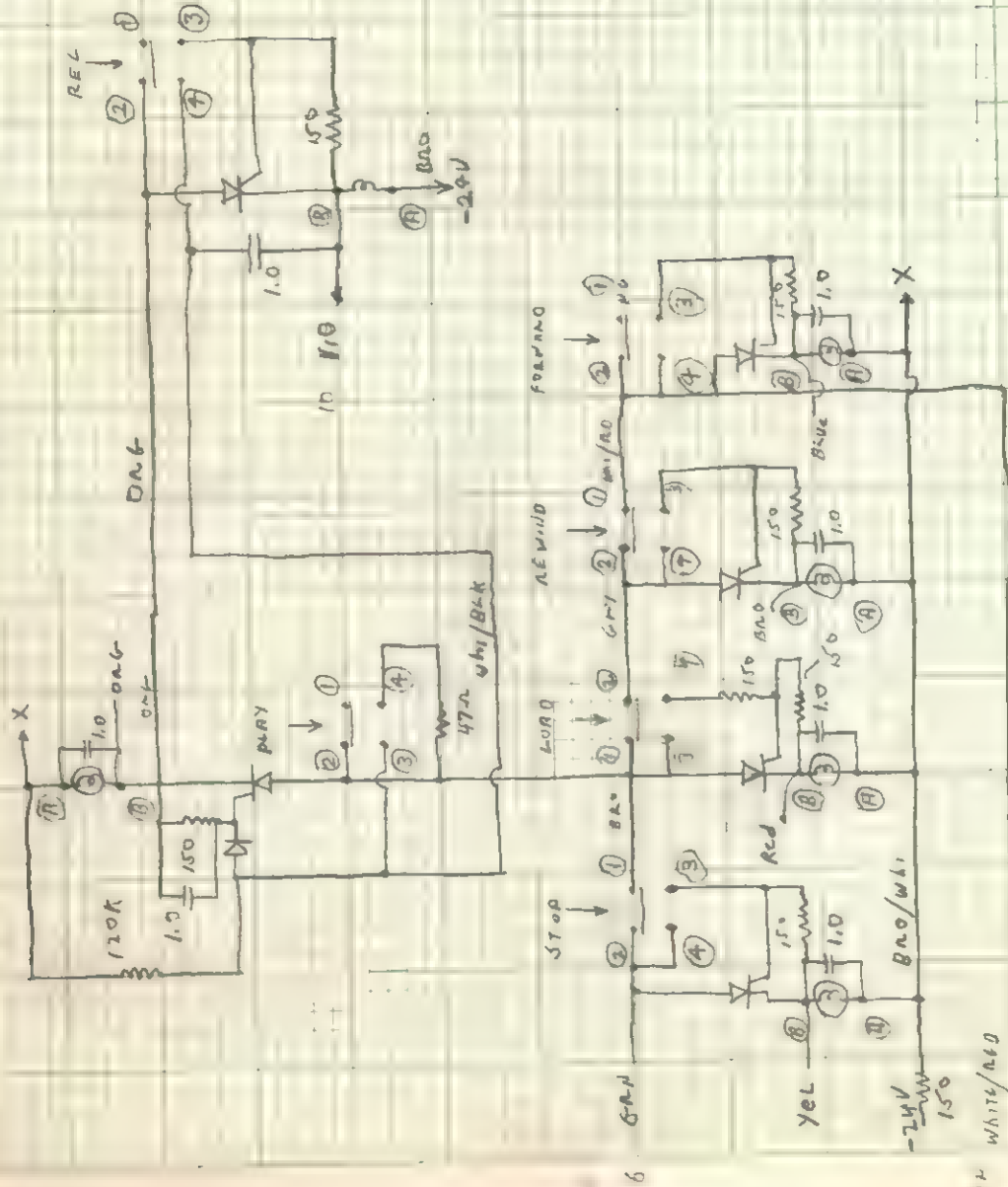


TIC-45: ALL REST,
 150 Ω IN 4001
 6LD NUMBERS

0 4 -27V LITE BUSS



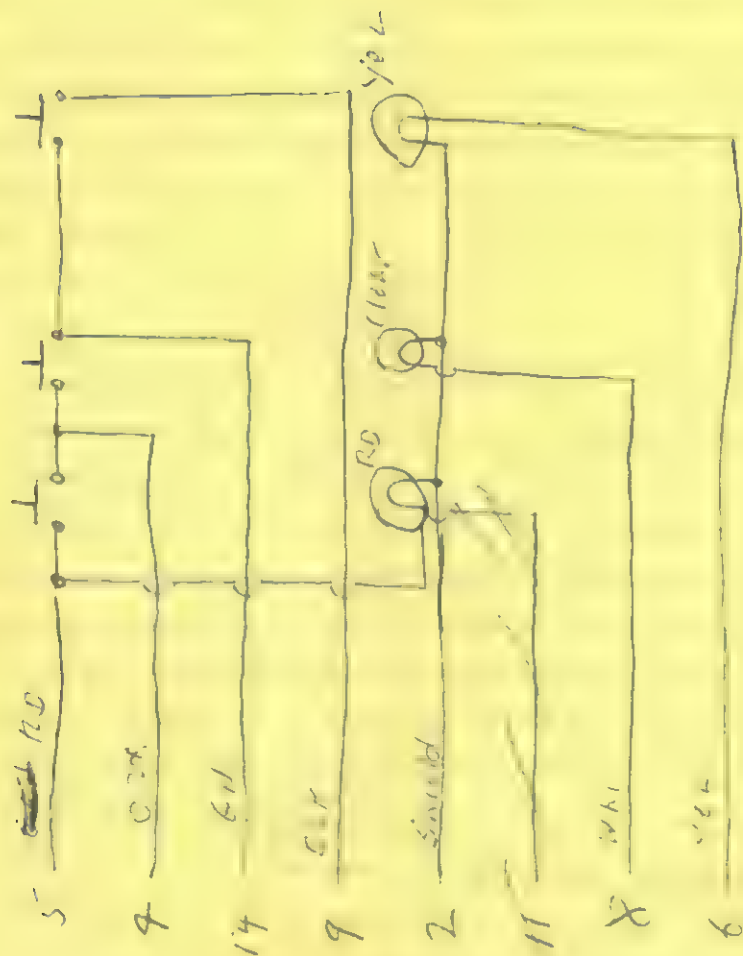
REMOTE AS OF 12-1-85



SCHEMATIC WHITE/RED

12-11-87
 1888 door
 12-11-87

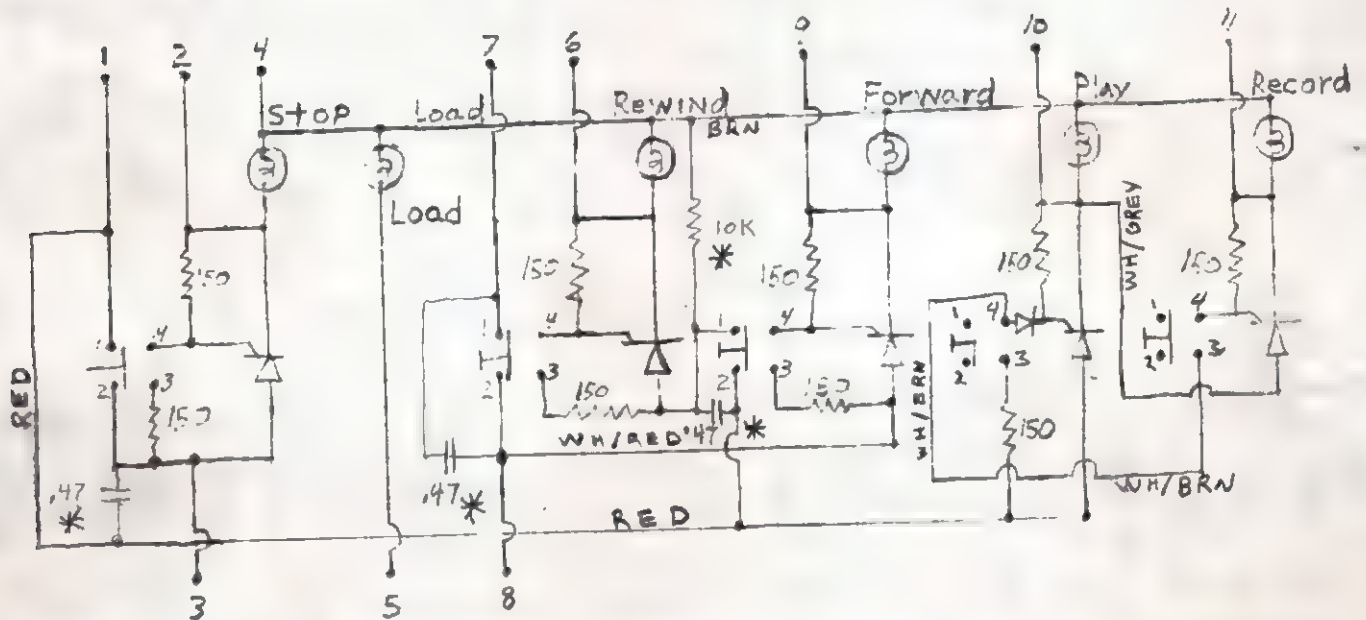
Ric. Play stop



36 Pin Connector

Remote Shuttle Control for the 103-104 Deck Series

* 5.2 4.9 7 - INSTALLED .47/50V CAPS ACROSS INTERLOCK CONTACTS. (3)
CONTACT CLEANERS + 10K RES PULLUP (1)



Numbered connections are pin numbers on blue Amphenol connector
#57-40360 on inside of Rear Deck Panel

CABLE: #1181/20
RICHEY ELECTRONICS

CONNECTOR PIN	WIRE COLOR
1	BROWN
2	RED
3	ORANGE
4	YELLOW
5	GREEN
6	BLUE
7	VIOLET
8	GREY
9	WHITE
10	BLACK
11	WH/YELLOW
B- 21	WH/BLUE
Y 22	WH/RED
X 23	WH/GREEN
Δ 24	WH/BLACK

CONNECTOR JUMPERS

27-29
31-32

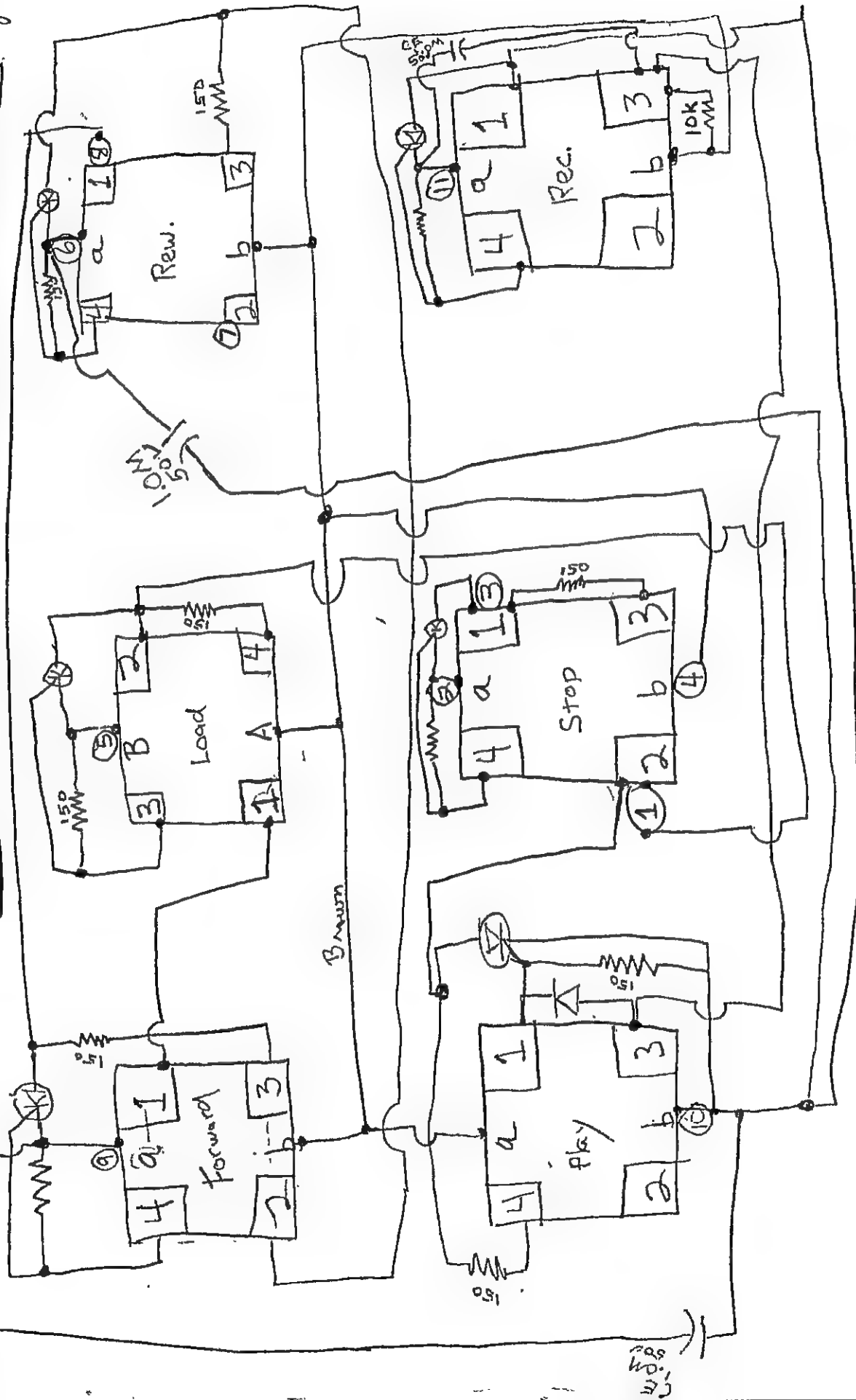
SCR'S ARE TIC 45
DIODE IS TS1
RESISTORS: 150Ω 1/4 WT.

Drawn by R. Wolfington

10-14-74 *[Signature]*

Stephens Remote

revised per observation 12.16.87 by Knappe



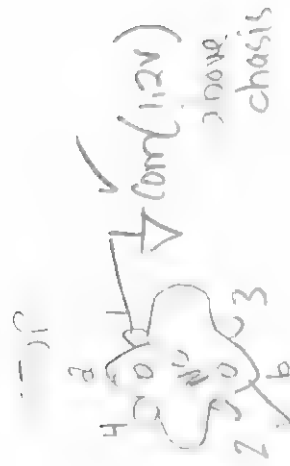
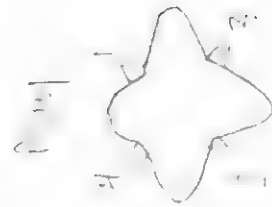
Differences from Stephens orig. scheme may be due to Spot Error or Popping Punch Out modification.

all SCR (transistors) = T1C45 (T17320(3))

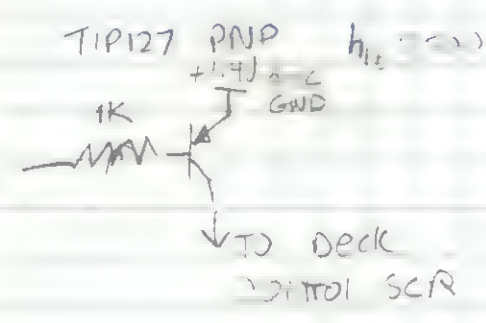
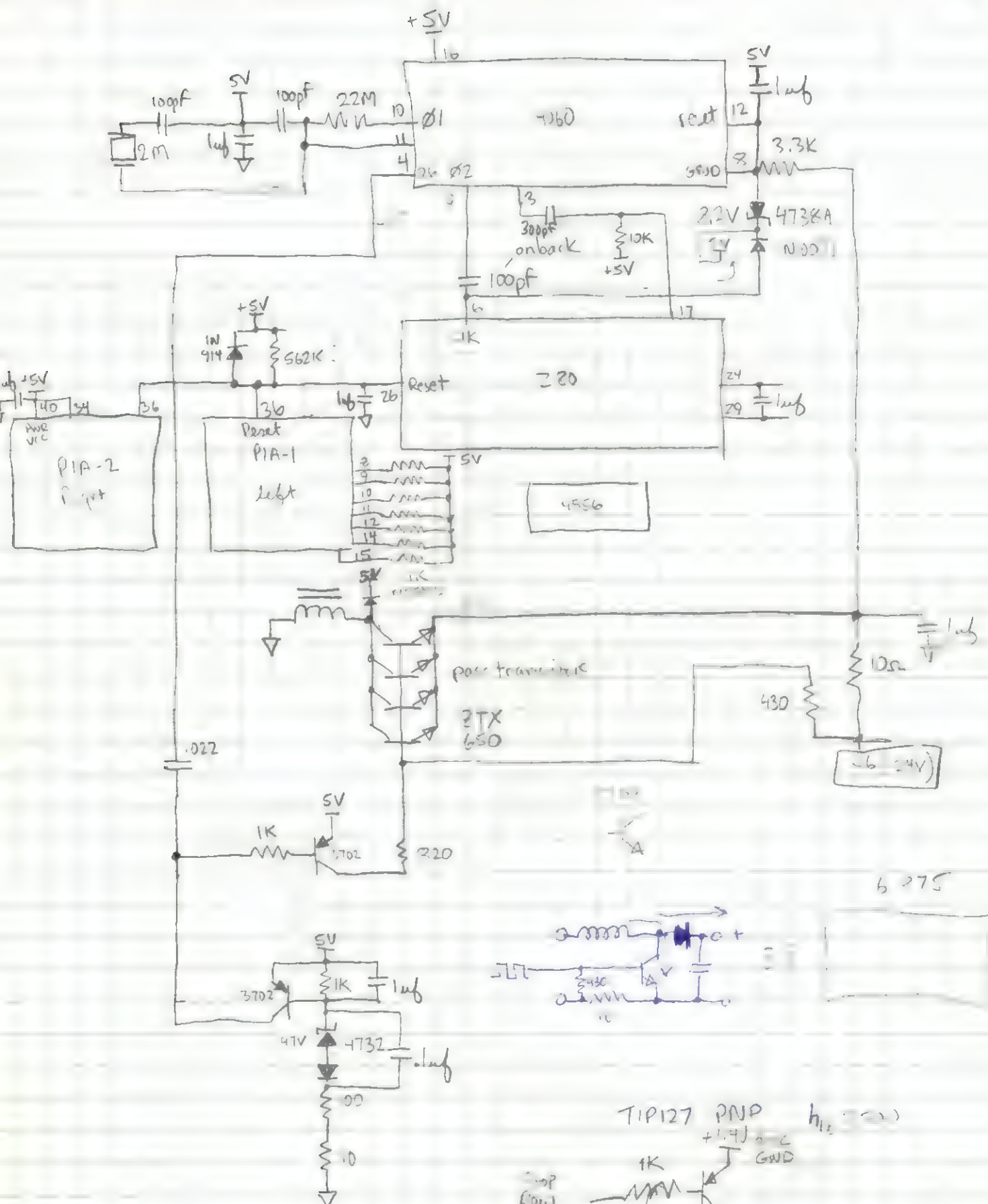
Load switch laid out in schematic also revised w/ physical layout - where it matches. Load switch

All resistors 150 ohm except Rec. 15 to Rec. 3 = 10K ohm

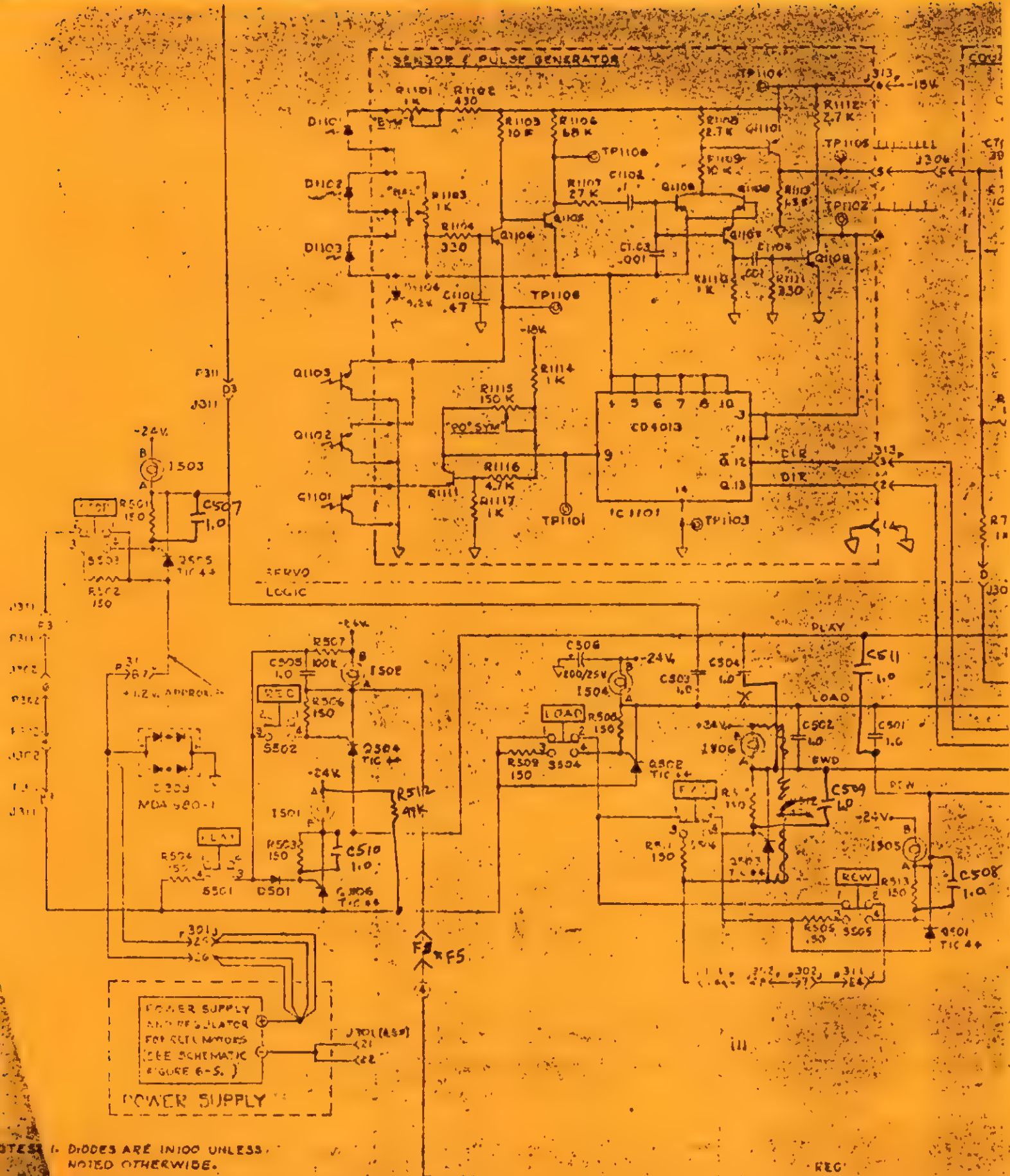
Penrose
Back View



Penrose play



TO Deck
control SCR



96

(TURNS ON BIAS OSC) BIAS OSC

STEPHENS REMOTE CONTROL "Y" ADAPTER CABLE COLOR CODE

2EA 57-40360

36 CONDUCT "BLUE/BRN" CABLE

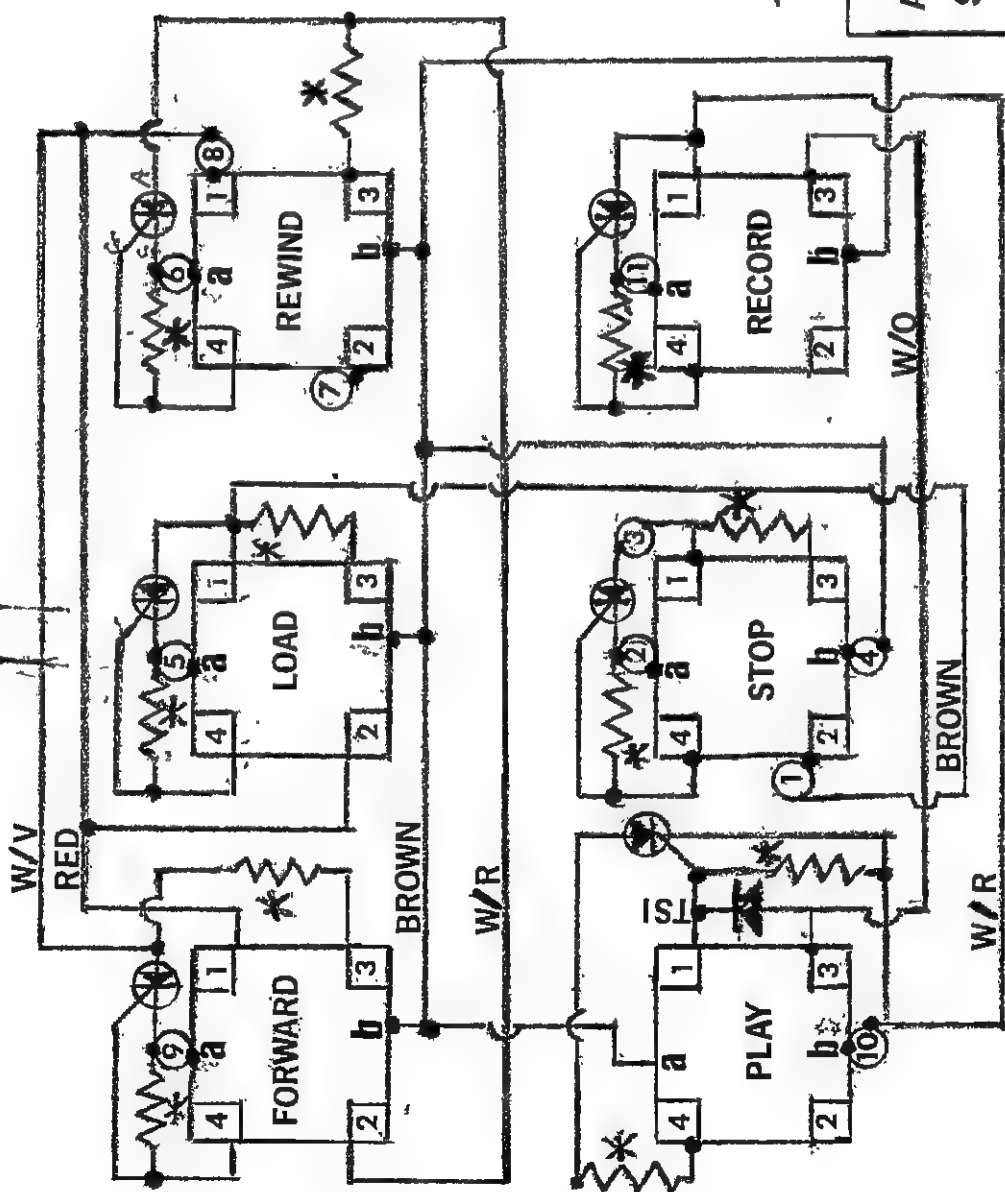
57-30360

1	19	BLU/WH	WHT/BLU	10
2	20	BLU/WH	WHT/BLU	11
3	21	BLU/WH	WHT/BLU	12
4	22	BLU/WH	WHT/BLU	13
5	23	BLU/WH	WHT/BLU	14
6	24	BLU/WH	WHT/BLU	15
7	25	BLU/WH	WHT/BLU	16
8	26	BLU/WH	WHT/BLU	17
9	27	BLU/WH	WHT/BLU	18
10	28	BLU/WH	WHT/BLU	19
11	29	BLU/WH	WHT/BLU	20
12	30	BLU/WH	WHT/BLU	21
13	31	BLU/WH	WHT/BLU	22
14	32	BLU/WH	WHT/BLU	23
15	33	BLU/WH	WHT/BLU	24
16	34	BLU/WH	WHT/BLU	25
17	35	BLU/WH	WHT/BLU	26
18	36	BLU/WH	WHT/BLU	27
19		GRN/WH	WHT/GRN	28
20		GRN/WH	WHT/GRN	29
21		GRN/WH	WHT/GRN	30
22		GRN/WH	WHT/GRN	31
23		GRN/WH	WHT/GRN	32
24		GRN/WH	WHT/GRN	33
25		GRN/WH	WHT/GRN	34

(REF.)

57-40360 57-30360

**AMPHENAL
57-30360 CONNECTOR**



SWITCHES	1	2	3	4	5	6	7	8	9	10	11	18	21	22	23	24	27-29	31-32
	BROWN	RED	ORANGE	YELLOW	GREEN	BLUE	VIOLET	GREY	WHITE	BLACK	W/YELLOW	W/VIOLET	W/BLUE	W/RED	W/GREEN	W/BLACK	JUMPER	JUMPER

NOTES *
150 Ω

SCHEMATIC

ALL SCR - TIC 45

SWITCH-1 $\frac{T_0^2}{3000}$

REMOTE SHUTTLE

SCALE:

APPROVED BY:

DATE: 10-12-77

DRAWN BY MAK KIANHON

REVISED

DRAWING NUMBER

110V

2

18V + 2V

2.5

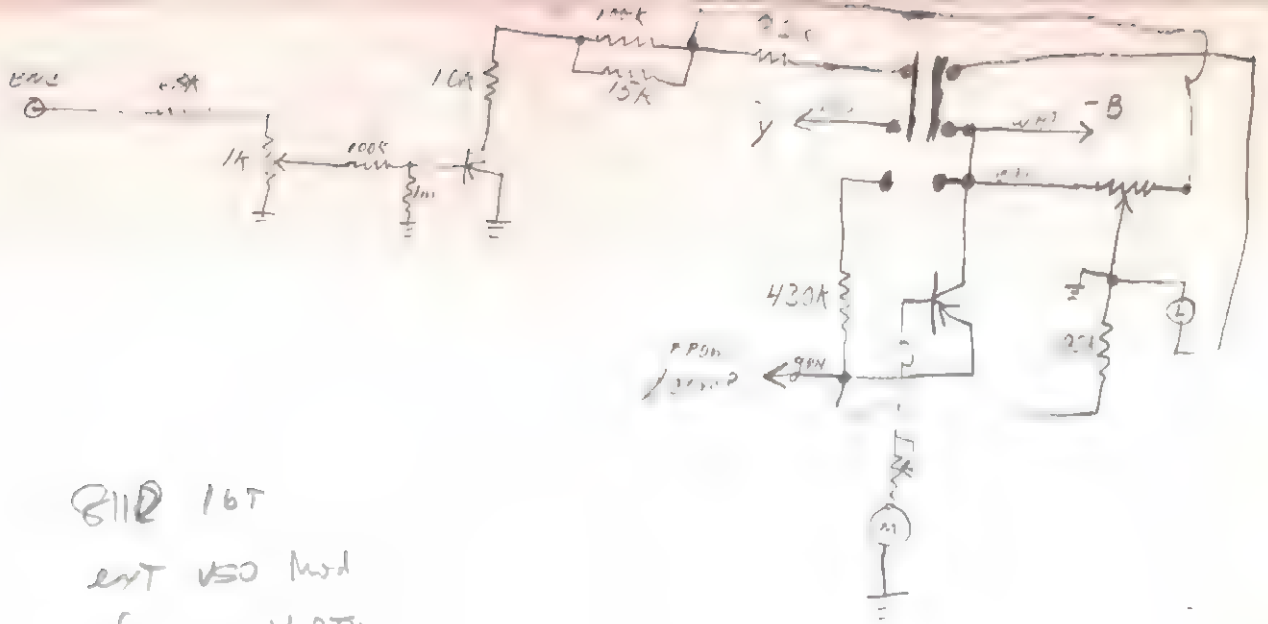
0



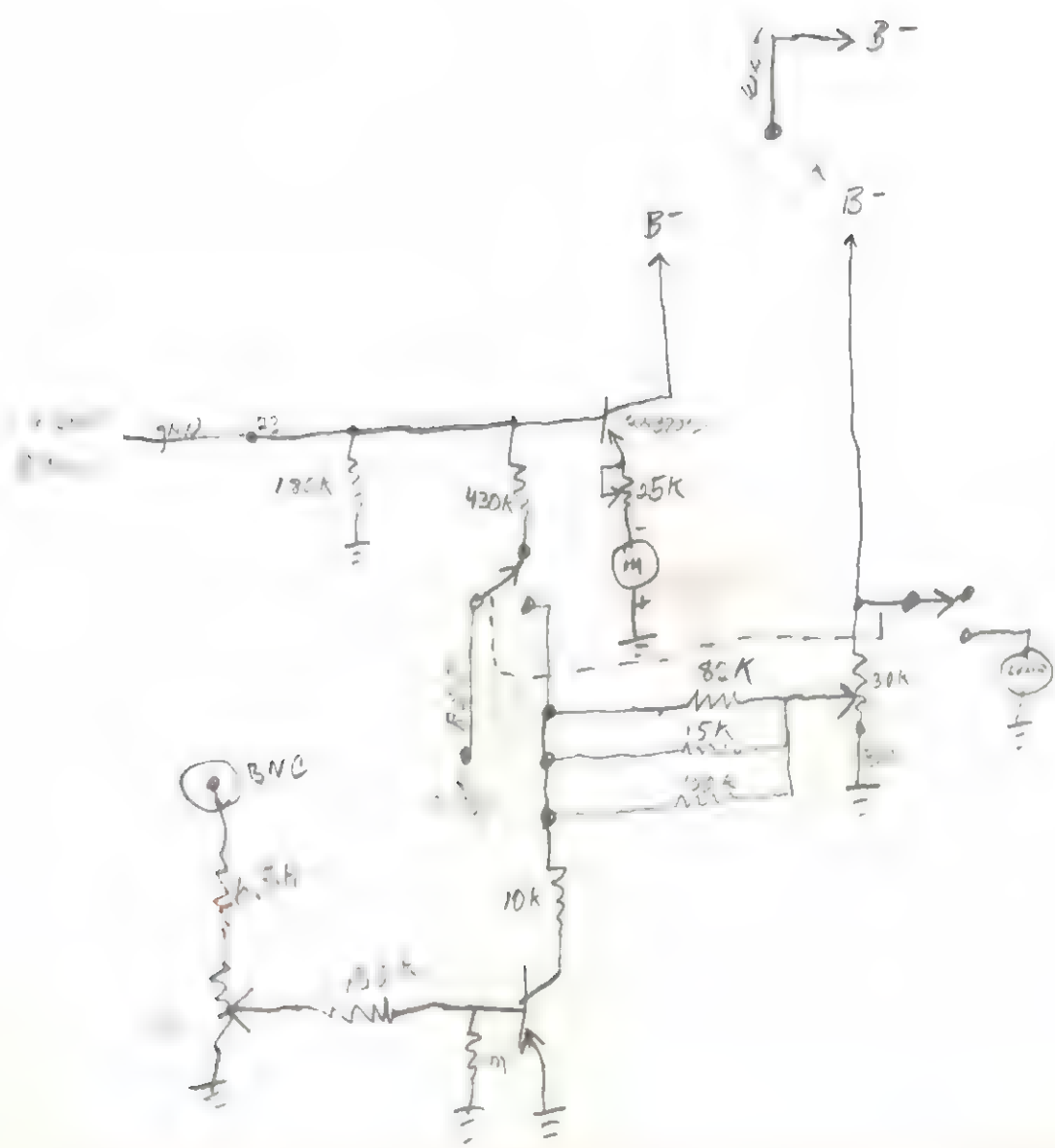
0

50-50

0 - 10



811D 16T
 ext VSO Mod
 for use w/ BTX



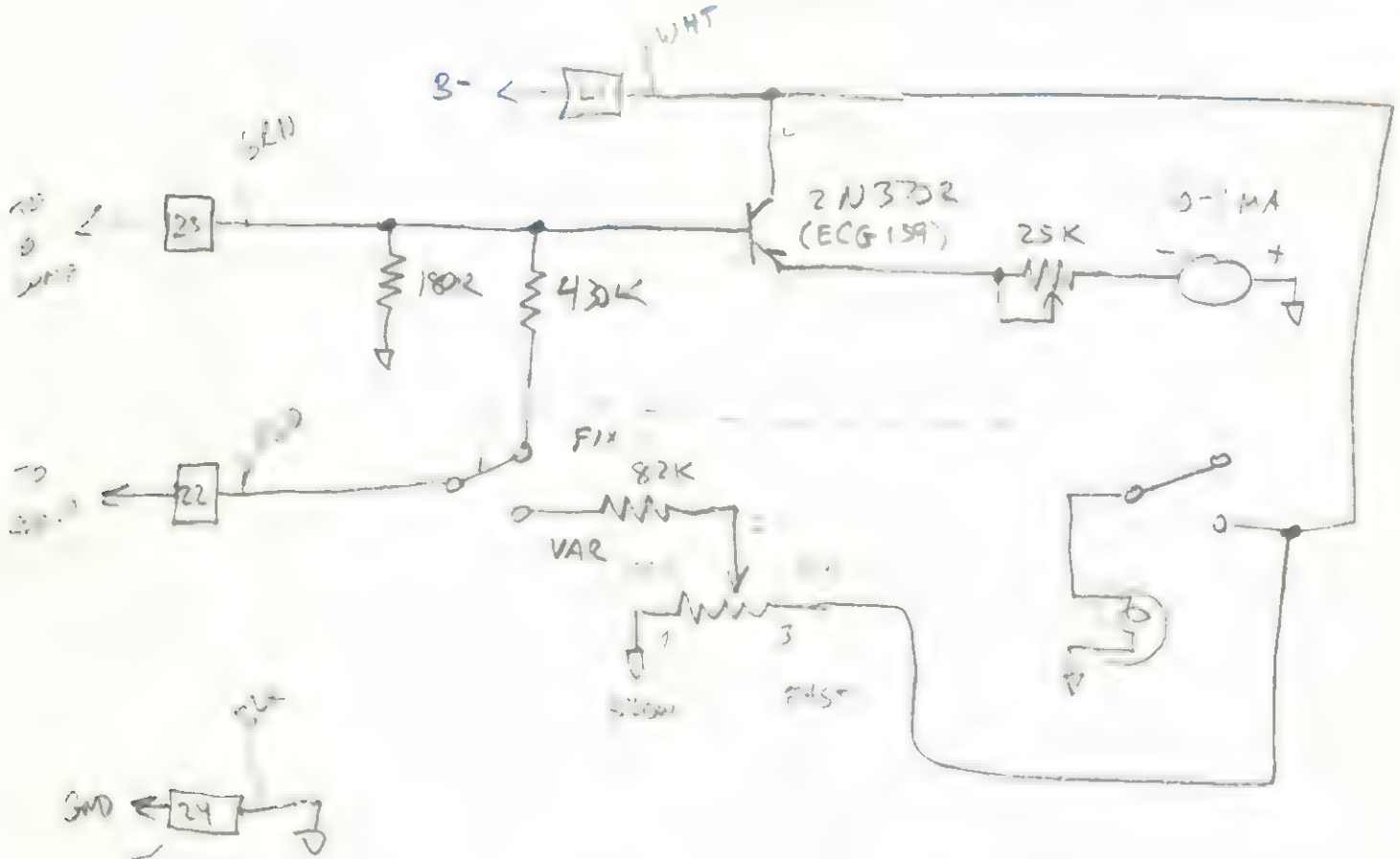
7/7/8 303



RECORDING SERVICES COMPANY

RSC

811 D SPARE ISO Box



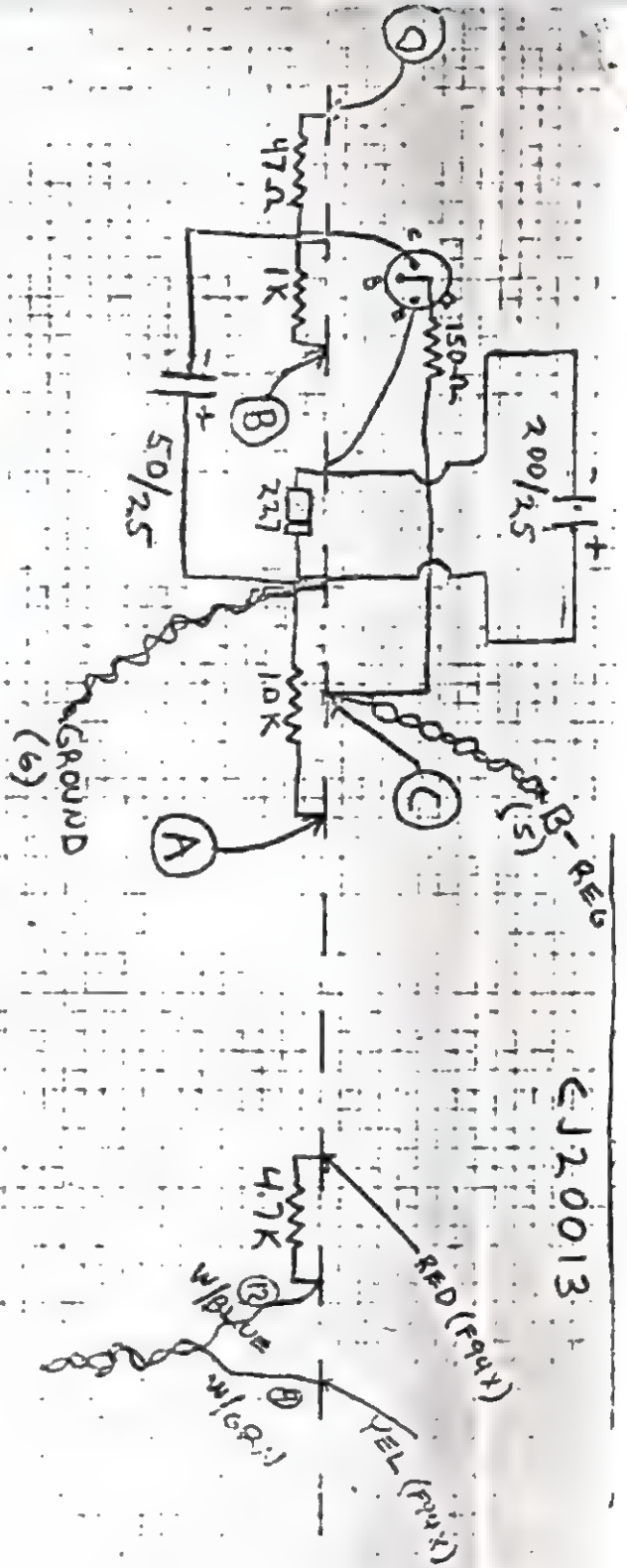
Amphenol Blue Ribbon
P/N 57-30360

in: 100 pers:



120013

REPRESENTS
POWER SUPPLY CABLE
CONNECTIONS



SMALL HEAT SINK SOCKET CONNECTIONS

- Q1-B + Q2-E VIO TO (A)
- Q1-C + Q2-C GRN TO (B)
- Q1-E YEL TO (C)
- Q2-B ORNG TO (D)

TR02

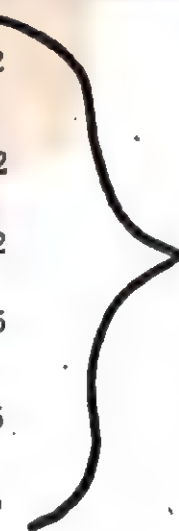
REGULATOR CIRCUIT (ON TERMINAL STRIP)

POWER SUPPLY CABLE

POWER SUPPLY (ALL DECKS)

222-11N31 A'PHENOL CONNECTOR (FEMALE)

(CUT CABLE LENGTH TO 6', 8" PEEL POWER SUPPLY END ABOUT 10" AND CONNECTOR END 1.05")

DRAWING REF. #	PIN #	CABLE WIRE COLOR	POWER SUPPLY LOCATION
	1	BROWN	 MOTOR TRANSISTORS
	2	RED	
	3	ORANGE	
	4	YELLOW	
	5	GREEN	
	6	BLUE	
	7	VIOLET	
	8	GREY	
	9	BLACK	
	10	WHITE/BLACK	
	11	WHITE/BROWN	POWER (3)
	12	WHITE/RED	
	13	WHITE/ORANGE	POWER (4)
	14	WHITE/YELLOW	
	15	WHITE/GREEN	YELLOW 4.7K
	16	WHITE/BLUE	
	17	WHITE/VIOLET	JP11 +
	18	WHITE/GREY	
	19	WHITE/BROWN/RED	JP12 -
	20	WHITE/BROWN/ORANGE	
	21	WHITE/BLACK/BROWN	5 OUTS 50 W OUT
	22	WHITE/BLACK/RED	
	23	WHITE/BLACK/ORANGE	27 V.D.C. DECK B - F2041 or RT 204
	24	WHITE/BLACK/YELLOW	
	25	WHITE/BLACK/GREEN	GROUND
	26	WHITE/BLACK/BLUE	
	27	WHITE/BLACK/VIOLET	NO CONNECTIONS
	28	WHITE/BLACK/GREY	
	29	WHITE/BROWN/YELLOW	
	30	WHITE/BROWN/GREEN	

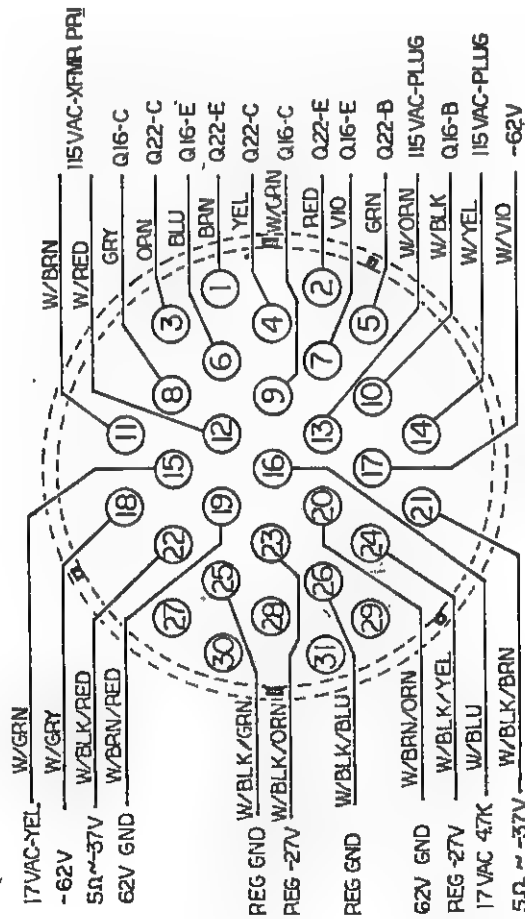
117VAC (60CY SOURCE)

F94X (DO NOT TWIST AT ENDS ONLY)

+ 60VDC. TO REGULATOR
ON BIAS SUPP.
F601 or F92A 5V- AUDIO AMP.
(REGULATED TO 48V.)

MOTOR COMMON

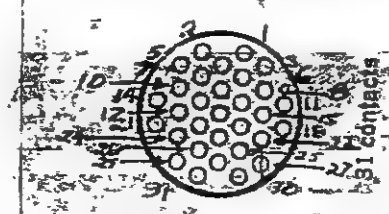




PA

Power Supply Cable

- | | | | |
|---------------------------|------------------|----------------------------------|-------------------------------|
| 1 Brown | } E, Q22 | Power Supply | 16/24/48 |
| 2 Red | | | |
| 3 Orange | | | |
| 4 Yellow | | | |
| 5 Green | } C, Q22 | 222-11N31 A.M. Phenol | Connector (female) |
| 6 Blue | | | |
| 7 Violet | } E, Q16 | (cut cable length) | to left, inches. |
| 8 Grey | | | |
| 9 Black | } C, Q16 | (Peel P.S. end about 1/2 inches) | |
| 10 White / Blk | | | |
| 11 White / Brown | } Power (3) | | |
| 12 White / Red | | | |
| 13 White / Orange | } Power (4) | | |
| 14 White / Yellow | | | |
| 15 White / Green | } Yellow | } F94X | } 60 00 AC @ 27VAC |
| 16 White / Blue | | | |
| 17 White / Violet | } 4.7K | | |
| 18 White / Grey | | | |
| 19 White / Brown / Red | } JD11 + | | |
| 20 White / Brown / Orange | | | |
| 21 White / Blk / Brown | } JD12 | } F684 | or F927 |
| 22 White / Blk / Red | | | |
| 23 White / Blk / Orange | } 5r 50w out | } B - Regulated | |
| 24 White / Blk / Yellow | | | |
| 25 White / Blk / Green | } Gnd | | } F2044 |
| 26 White / Blk / Blue | | | |
| 27 White / Black / Vio | } no connections | | |
| 28 White / Black / Grey | | | |
| 29 White / Brown / Yellow | | | |
| 30 White / Brown / Green | | | |



This is a front view

LENA copy

POWER SUPPLY 16/24/40

Cable Female
222-11N31 AMPHENOL CONNECTOR (FEMALE)

(CUT CABLE LENGTH TO 6 FT. 8 INCHES
PEEL P.S. END ABOUT 10 INCHES)

REMOTE
CONTROL

1 BROWN } E,Q22
2 RED }

3 ORANGE } C,Q22
4 YELLOW }

5 GREEN B,Q22

6 BLUE } E,Q16
7 VIOLET }

8 GREY } C,Q16
9 BLACK }

10 WHITE/BLACK B,Q16

11 WHITE/BROWN } POWER (3)
12 WHITE/RED }

13 WHITE/ORANGE } POWER (4)
14 WHITE/YELLOW }

15 WHITE/GREEN } YELLOW } F94X
16 WHITE/BLUE } 4.7K }

17 WHITE/VIOLET } JD11 +
18 WHITE/BLACK }

19 WHITE/BROWN/RED } JD12- } F68U or F92A
20 WHITE/BROWN/ORANGE }

21 WHITE/BLACK/BROWN } 5 OHMS 50 W OUT
22 WHITE/BLACK/RED }

23 WHITE/BLACK/ORANGE } B - REGULATED } F204U
24 WHITE/BLACK/YELLOW }

25 WHITE/BLACK/GREEN } GROUND
26 WHITE/BLACK/BLUE }

27 WHITE/BLACK/VIOLET } NO CONNECTIONS
28 WHITE/BLACK/BLACK
29 WHITE/BROWN/YELLOW
30 WHITE/BROWN/GREEN }

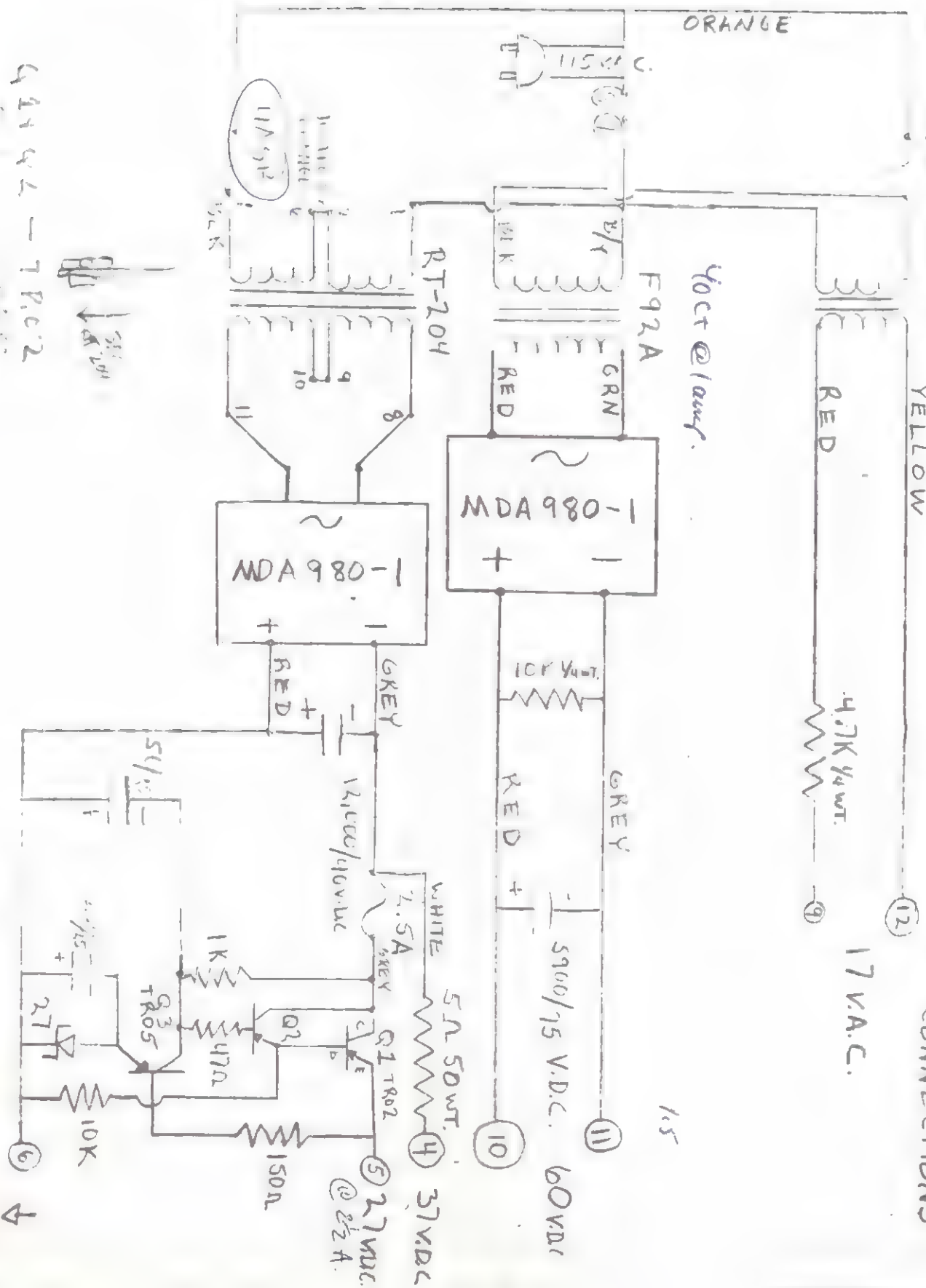
27 VAC
for 60 N. source

—

Deborah F. Coffey 3/11/16

YELLLOW

R SUPPLY ECF: 8/16
CIRCLED NUMBERS (2) ARE CABLE CONNECTIONS



VA Connections: Power supply (Deck female).

Plot	Tree	Height	DBH	Species	Notes
10	Red	10.0	10.0	Red	
11	Red	11.0	11.0	Red	
12	Red	12.0	12.0	Red	
13	Red	13.0	13.0	Red	
14	Red	14.0	14.0	Red	
15	Red	15.0	15.0	Red	
16	Red	16.0	16.0	Red	
17	Red	17.0	17.0	Red	
18	Red	18.0	18.0	Red	
19	Red	19.0	19.0	Red	
20	Red	20.0	20.0	Red	
21	Red	21.0	21.0	Red	
22	Red	22.0	22.0	Red	
23	Red	23.0	23.0	Red	
24	Red	24.0	24.0	Red	
25	Red	25.0	25.0	Red	
26	Red	26.0	26.0	Red	
27	Red	27.0	27.0	Red	
28	Red	28.0	28.0	Red	
29	Red	29.0	29.0	Red	
30	Red	30.0	30.0	Red	
31	Red	31.0	31.0	Red	
32	Red	32.0	32.0	Red	
33	Red	33.0	33.0	Red	
34	Red	34.0	34.0	Red	
35	Red	35.0	35.0	Red	
36	Red	36.0	36.0	Red	
37	Red	37.0	37.0	Red	
38	Red	38.0	38.0	Red	
39	Red	39.0	39.0	Red	
40	Red	40.0	40.0	Red	
41	Red	41.0	41.0	Red	
42	Red	42.0	42.0	Red	
43	Red	43.0	43.0	Red	
44	Red	44.0	44.0	Red	
45	Red	45.0	45.0	Red	
46	Red	46.0	46.0	Red	
47	Red	47.0	47.0	Red	
48	Red	48.0	48.0	Red	
49	Red	49.0	49.0	Red	
50	Red	50.0	50.0	Red	

connections - (Réimäie Synch Box) (Female)

T52B - Born - B - ① White
 T51U - Red - 22 - ④ Red
 T52N - Grn - 22 - X(4) - Green 11
 T51G - White - 20 - B - ④
 T51H - 22 - ④

SD Connections (Electronics)

Pin	Signal	Color
1	SD3 + RYA B.	wh/yell
2	SD4	wh/gry
3		
4	Pre 4	Uio
5	RYA 10	wh/vio
6		

7 SE (HOT RK)

8 SD4 + RYA 6

9 RYA 6

10 RYA 7

11 RYA 10

12 RYA 11

13 Front

14 Front

15 Front

16 Front

17 Front

18 Front

19 Front

20 Front

21 Front

22 Front

23 Front

24 Front

25 Front

26 Front

27 Front

28 Front

29 Front

30 Front

31 Front

32 Front

33 Front

34 Front

35 Front

36 Front

37 Front

38 Front

39 Front

40 Front

41 Front

42 Front

43 Front

44 Front

45 Front

46 Front

47 Front

48 Front

49 Front

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51 Front

52 Front

53 Front

54 Front

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59 Front

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62 Front

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64 Front

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67 Front

68 Front

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70 Front

71 Front

72 Front

73 Front

74 Front

75 Front

76 Front

77 Front

78 Front

79 Front

80 Front

81 Front

82 Front

83 Front

84 Front

85 Front

86 Front

87 Front

88 Front

89 Front

90 Front

91 Front

92 Front

93 Front

94 Front

95 Front

96 Front

97 Front

98 Front

99 Front

100 Front

Power supply connector on deck

AMP HSE NO. 222-22N31 (MALE)

22E GND.

3 - GREEN } 22C

4 - GREEN } 22B

5 - GREEN } 22A

6 - YEL. } 22E

7 - YEL. } 22E

8 - ORANGE } 22E

9 - ORANGE } 22E

10 - WHT/GRAY } 22E

11 - RED } 22E

12 - RED } 22E

13 - RED } 22E

14 - RED } 22E

15 - RED } 22E

16 - ORANGE } 22E

17 - RED } 22E

18 - RED } 22E

19 - RED } 22E

20 - RED } 22E

21 - WH. ITE } 22E

22 - WH. ITE } 22E

23 - VIOLET } 22E

24 - VIOLET } 22E

25 - BLK } 22E

26 - BLK } 22E

GND.

GND.

H7

F7

D7

B7

310163 - R

310163 - T

310163 - M

310163 - H

310163 - J

LEFT SW.

UNIT

U.C. 31

UD 11

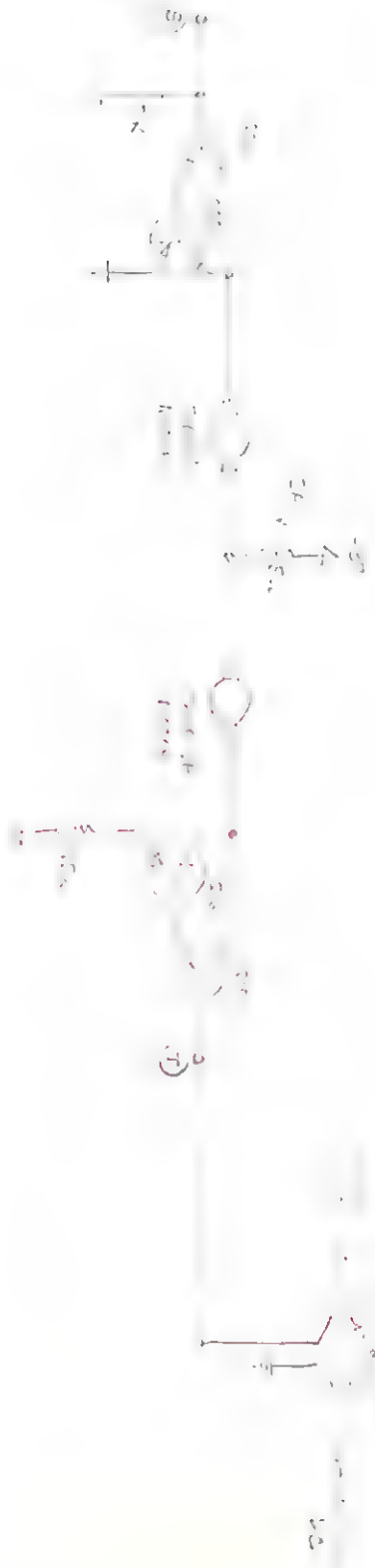
UD 12

310163 - P

B - - 10N TERMINAL STRIP

Q16 A1 422 AY= 2V6329
MOUNTED ON POWER SUPPLY

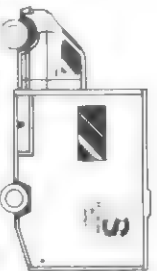
Simplified SKVD



to Ver. world



to Ver. world



RECORDING SERVICES COMPANY

PROFESSIONAL RECORDING EQUIPMENT RENTALS

STUDIO CITY, CA.

766-7191

24 HOURS

SONY YAMAHA BTX DOLBY DBX MULTISYNC
GRAY LEXICON EVENTIDE AMPEX CTYPE MCI STEPHENS
SONY YAMAHA BTX DOLBY DBX MULTISYNC
GRAY LEXICON EVENTIDE AMPEX CTYPE MCI STEPHENS
SONY YAMAHA BTX DOLBY DBX MULTISYNC
GRAY LEXICON EVENTIDE AMPEX CTYPE MCI STEPHENS

811D-16

811C-16 Tape System

Sel-Sync Panel 1 of 2

SJ9	SJ10	SJ11	SJ12	SJ13	SJ14	Switch	CKT.
				35		↑ Sel-Sync Switches 1-16	E In1
				36			E In2
				37			E In3
				38			E In4
				39			E In5
				40			E In6
				41			E In7
				42			E In8
					35		E In9
					36		E In10
					37		E In11
					38		E In12
					39		E In13
					40		E In14
					41		E In15
					42		E In16
						* Sel-Sync Switches 1-16	E Out1
							E Out2
							E Out3
							E Out4
							E Out5
							E Out6
							E Out7
							E Out8
							E Out9
							E Out10
							E Out11
							E Out12
							E Out13
							E Out14
							E Out15
							E Out16
						* Sel-Sync Switches 1-16	W/B 1
							W/B 2
							W/B 3
							W/B 4
							W/B 5
							W/B 6
							W/B 7
							W/B 8
							W/B 9
							W/B 10
							W/B 11
							W/B 12
							W/B 13
							W/B 14
							W/B 15
							W/B 16
						* Sel-Sync Switches 1-16	W/G 1
							W/G 2
							W/G 3
							W/G 4
							W/G 5
							W/G 6
							W/G 7
							W/G 8

SJ9 Line Amp #1
(chnl 1-10)

SJ10 Line Amp #2
(chnl 5-8)

SJ11 Line Amp #3
(chnl 9-12)

SJ12 Line Amp #4
(chnl 13-16)

SJ13 Machine In-Out
Channels 1-8

SJ14 Machine In-Out
Channels 9-16

← 150 ohm OUTS

← 150 ohm OUTS
connectors

1-78 ARMY
811D-16

SJ8 Input-Output
 SJ9 Line Amp #1
 (chnl 1-4)
 SJ10 Line Amp #2
 (chnl 5-8)
 SJ11 Line Amp #3
 (chnl 9-12)
 SJ12 Line Amp #4
 (chnl 13-16)
 SJ13 Machine In-Out
 Channels 1-8
 SJ14 Machine In-Out
 Channels 9-16

See additional
sheet for
completed
wiring of SJ8.

ORG - N
V10 -> 6" jumper
Ghes -> 17" jumper
On SJ8:
F26 jumper to A25 (red, B)
H26 jumper to C25 (pink, B)
1/2" long

BIT-16 TAPE SYSTEM SELF SYNC PAGE 1

SJ10	SJ11	SJ12	SJ13	SJ14	SJ18	SWITCH	CKT
					B 16		SS 1
					D 16		SS 2
					F 16		SS 3
					H 16		SS 4
					A 17		SS 5
					C 17		SS 6
					E 17		SS 7
					G 17		SS 8
					B 18		SS 9
					D 18		SS 10
					F 18		SS 11
					H 18		SS 12
					A 19		SS 13
					C 19		SS 14
					E 19		SS 15
					G 19		SS 16
					B 20		RR 1
					D 20		RR 2
					F 20		RR 3
					H 20		RR 4
					A 21		RR 5
					C 21		RR 6
					E 21		RR 7
					G 21		RR 8
					B 22		RR 9
					D 22		RR 10
					F 22		RR 11
					H 22		RR 12
					A 23		RR 13
					C 23		RR 14
					E 23		RR 15
					G 23		RR 16
			26				1
			27				2
			28				3
			29				4
			30				5
			31				6
			32				7
			33				8
			34				9
			35				10
			36				11
			37				12
			38				13
			39				14
			40				15
			41				16
			42				17
			43				18
			44				19
			45				20
			46				21
			47				22
			48				23
			49				24
			50				25
			51				26
			52				27
			53				28
			54				29
			55				30
			56				31
			57				32
			58				33
			59				34
			60				35
			61				36
			62				37
			63				38
			64				39
			65				40
			66				41
			67				42
			68				43
			69				44
			70				45
			71				46
			72				47
			73				48
			74				49
			75				50
			76				51
			77				52
			78				53
			79				54
			80				55
			81				56
			82				57
			83				58
			84				59
			85				60
			86				61
			87				62
			88				63
			89				64
			90				65
			91				66
			92				67
			93				68
			94				69
			95				70
			96				71
			97				72
			98				73
			99				74
			100				75

COLOR CODE

STRIPPED

(DOLBY) COLOR CODE

SYNC BUSS

(3-4-76)

84

E24

W/NO

REG. BUSS

B 26

W/BLK

B 24

W/RED

D 24

W/GRN

E 24

W/BLU

	SJ11	SJ12	SJ13	SJ14	Switch	CKT.
			35			E In1
			36			E In2
			37			E In3
			38			E In4
1			39			E In5
2			40			E In6
1			41			E In7
1			42			E In8
	H1			35		E In9
	E2			36		E In10
	D1			37		E In11
	B1			38		E In12
		H1		39		E In13
		E2		40		E In14
		D1		41		E In15
		B1		42		E In16
			43			E Out1
			44			E Out2
			45			E Out3
			46			E Out4
13			47			E Out5
13			48			E Out6
13			49			E Out7
13			50			E Out8
	H13			43		E Out9
	F13			44		E Out10
	D13			45		E Out11
	B13			46		E Out12
		H13		47		E Out13
		F13		48		E Out14
		D13		49		E Out15
		B13		50		E Out16
						W/B 1
						W/B 2
						W/B 3
						W/B 4
						W/B 5
						W/B 6
						W/B 7
						W/B 8
	H7					W/B 9
	E9					W/B 10
	D7					W/B 11
	B5					W/B 12
		H7				W/B 13
		E9				W/B 14
		D7				W/B 15
		B5				W/B 16
						W/G 1
						W/G 2
						W/G 3
						W/G 4
						W/G 5
						W/G 6
						W/G 7
						W/G 8

SJ9 Line Amp #1
(chnl 1-4)
SJ10 Line Amp #2
(chnl 5-8)
SJ11 Line Amp #3
(chnl 9-12)
SJ12 Line Amp #4
(chnl 13-16)
SJ13 Machine In-Out
Channels 1-8
SJ14 Machine In-Out
Channels 9-16

← 1500 OUTS

← solder
clean
check
connector

1-78 APPLY
811D-16

SJ9	SJ10	SJ11	SJ12	SJ13	SJ14	Switch	CKT
H1				35			E In1
E2				36			E In2
D1				37			E In3
B1				38			E In4
H1				39			E In5
E2				40			E In6
D1				41			E In7
B1				42			E In8
H1				35			E In9
E2				36			E In10
D1				37			E In11
B1				38			E In12
H1				39			E In13
E2				40			E In14
D1				41			E In15
B1				42			E In16
H13				43			E Out1
E13				44			E Out2
D13				45			E Out3
B13				46			E Out4
H13				47			E Out5
E13				48			E Out6
D13				49			E Out7
B13				50			E Out8
H13				43			E Out9
E13				44			E Out10
D13				45			E Out11
B13				46			E Out12
H13				47			E Out13
E13				48			E Out14
D13				49			E Out15
B13				50			E Out16
H7							W/B 1
E8							W/B 2
D7							W/B 3
B5							W/B 4
H7							W/B 5
E8							W/B 6
D7							W/B 7
B5							W/B 8
H7							W/B 9
E8							W/B 10
D7							W/B 11
B5							W/B 12
H7							W/B 13
E8							W/B 14
D7							W/B 15
B5							W/B 16
G10							W/G 1
E10							W/G 2
C10							W/G 3
A10							W/G 4
G10							W/G 5
E10							W/G 6
C10							W/G 7
A10							W/G 8

SJ10	SJ11	SJ12	SJ13	SJ14	SJ15	Switch	UXT.
G10						W/G-9	
E10						W/G-10	
C10						W/G-11	
A10						W/G-12	
	G10					W/G-13	
	E10					W/G-14	
	C10					W/G-15	
	A10					W/G-16	
					B6	PB Pre1	
					D6	PB Pre2	
					F6	PB Pre3	
					H6	PB Pre4	
					A7	PB Pre5	
					C7	PB Pre6	
					E7	PB Pre7	
					G7	PB Pre8	
	H5				B8	PB Pre9	
	E5				D8	PB Pre10	
	C5				F8	PB Pre11	
	A5				H8	PB Pre12	
		H5			A9	PB Pre13	
		E5			C9	PB Pre14	
		C6			E9	PB Pre15	
		A6			G9	PB Pre16	
					A1	Rec Amp1	
					C1	Rec Amp2	
					E1	Rec Amp3	
					G1	Rec Amp4	
					B2	Rec Amp5	
					D2	Rec Amp6	
					F2	Rec Amp7	
					H2	Rec Amp8	
	G2				A3	Rec Amp9	
	D3				C3	Rec Amp10	
	C2				E3	Rec Amp11	
	A2				G3	Rec Amp12	
		G2			B4	Rec Amp13	
		D3			D4	Rec Amp14	
		C2			F4	Rec Amp15	
		A2			H4	Rec Amp16	
G8	G8	G8		(2-4-76)	H21	-39v	
H11	H11	H11		(3-4)	E25	Predim	
S12	G12	G12			G25	33/1/3	
F1	F1	F1	10-25	10-25	A5,15	Ground	
F3	F3	F3			C5,15	"	
F5	F5	F5			E5,15	"	
F7	F7	F7			G5,15	"	
F9	F9	F9			B10	"	
F11	F11	F11			D10	"	
E12	E12	E12			F10	"	
					H10	"	
2N052	2N052	2N052	57	57	2N104	Conn.	
			40500	40500			

SJ8 Input-Output

SJ9 Line Amp #1
(chn1 1-15)

SJ10 Line Amp 72
(Chn 1-5-8)

SJ41 Line Amp #3
Chnl 9-120

SJ12 Line Amp #4
(chn1 13-19)

SJ13 Machine In-Out
Channels 1-8

SJ14 Machine In-Out
Channels 9-15

★ See additional
sheet for
completed
wiring of SJ8.

On SJ8

F26 jumper to A25 (red, B

H26 jumper to C25 (blk, E

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

812-16 TAPE SYSTEM

Saint-Simon

SJ10	SJ11	SJ12	SJ13	SJ14	SJR	SWITCH	CRT
					B 16		SS 1
					D 16		SS 2
					E 16		SS 3
					H 16		SS 4
					A 17		SS 5
					C 17		SS 6
					E 17		SS 7
					G 17		SS 8
					H 18		SS 9
					D 18		SS 10
					F 18		SS 11
					H 18		SS 12
					A 19		SS 13
					C 19		SS 14
					E 19		SS 15
					G 19		SS 16
					B 20		RR 1
					D 20		RR 2
					H 20		RR 4
					A 21		RR 5
					C 21		RR 6
					E 21		RR 7
					G 21		RR 8
					A 22		RR 9
					D 22		RR 10
					F 22		RR 11
					H 22		RR 12
					A 23		RR 13
					C 23		RR 14
					E 23		RR 15
					G 23		RR 16
			26				1
			27				2
			28				3
			29				4
			30				5
			31				6
			32				7
			33				8
				26			9
				27			10
				28			11
				29			12
				30			13
				31			14
				32			15
				33			16
		(2-4-76)	33		FACE	W/100	RR 10
					B 26	W/100	
					B 24	W/100	
					D 24	W/100	

COLLEGE

STRIPPE

(POLY) POLY CO DE

5414.5.2.5

$\{2-4=76\}$

FOR WIND REAR

811D STRACK PINOUTS

STEPHENS 811D-8 ELECTRONICS

Input-Output Connector

(Amphenol 57-40500 Chassis)
(Amphenol 57-30500 Cable)

<u>Pin</u>	<u>Connection</u>
10-17	Ground Record In
18-25	Ground Playback Out
26-33	Dolby Enable
34	Master Record
35-42	Record In Hot (35 = 1)
43-50	Playback Out Hot (43 = 1)

STEPHENS 811D-8 ELECTRONICS

Input-Output Connector

(Amphenol 57-40500 Chassis)
(Amphenol 57-30500 Cable)

<u>Pin</u>	<u>Connection</u>
10-17	Ground Record In
18-25	Ground Playback Out
26-33	Dolby Enable
34	Master Record
35-42	Record In Hot (35 = 1)
43-50	Playback Out Hot (43 = 1)

4-TRACK

PIN NO.	CONNECTION	CONNECTOR N. J20
1	NOT USED	
2	"	
3	"	
4	"	
5	"	
6	"	
7	"	
8	"	
9	"	
10	Record Input, GND	1
11	"	2
12	"	3
13	"	4
14	NOT USED	
15	"	
16	"	
17	"	
18	Playback Out, GND	1
19	"	2
20	"	3
21	"	4
22	NOT USED	
23	"	
24	"	
25	"	
26	Dolby Control, 24V	1
27	"	2
28	"	3
29	"	4
30	NOT USED	
31	"	
32	"	
33	"	
34	Dolby Control, Com	
35	Record Input, High	1
36	"	2
37	"	3
38	"	4
39	NOT USED	
40	"	
41	"	
42	"	
43	Playback Out, High	1
44	"	2
45	"	3
46	"	4
47	NOT USED	
48	"	
49	"	
50	"	

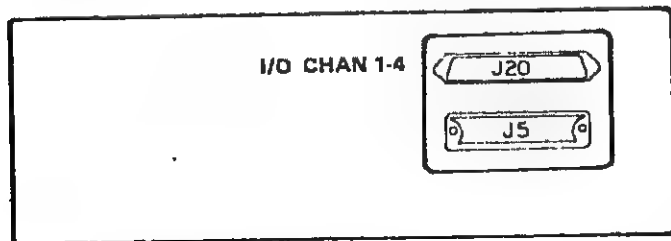


Figure 3-1. 4-Track Sync Panel, Rear Connectors

8-TRACK

PIN NO.	CONNECTION	CONNECTOR NO. J20
1	NOT USED	
2	"	
3	"	
4	"	
5	"	
6	"	
7	"	
8	"	
9	"	
10	Record Input, GND	1
11	"	2
12	"	3
13	"	4
14	"	5
15	"	6
16	"	7
17	"	8
18	Playback Out, GND	1
19	"	2
20	"	3
21	"	4
22	"	5
23	"	6
24	"	7
25	"	8
26	Dolby Control, 24V	1
27	"	2
28	"	3
29	"	4
30	"	5
31	"	6
32	"	7
33	"	8
34	Dolby Control, Com	
35	Record Input, High	1
36	"	2
37	"	3
38	"	4
39	"	5
40	"	6
41	"	7
42	"	8
43	Playback Out, High	1
44	"	2
45	"	3
46	"	4
47	"	5
48	"	6
49	"	7
50	"	8

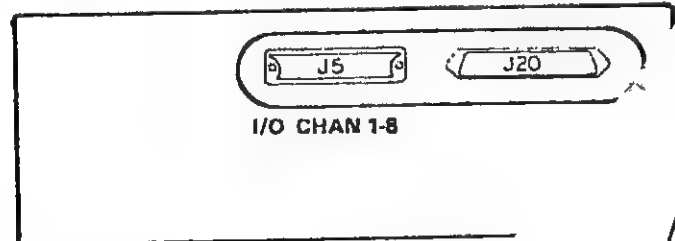
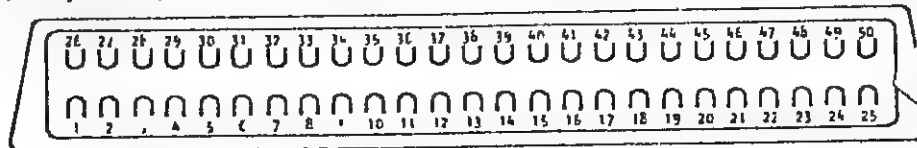
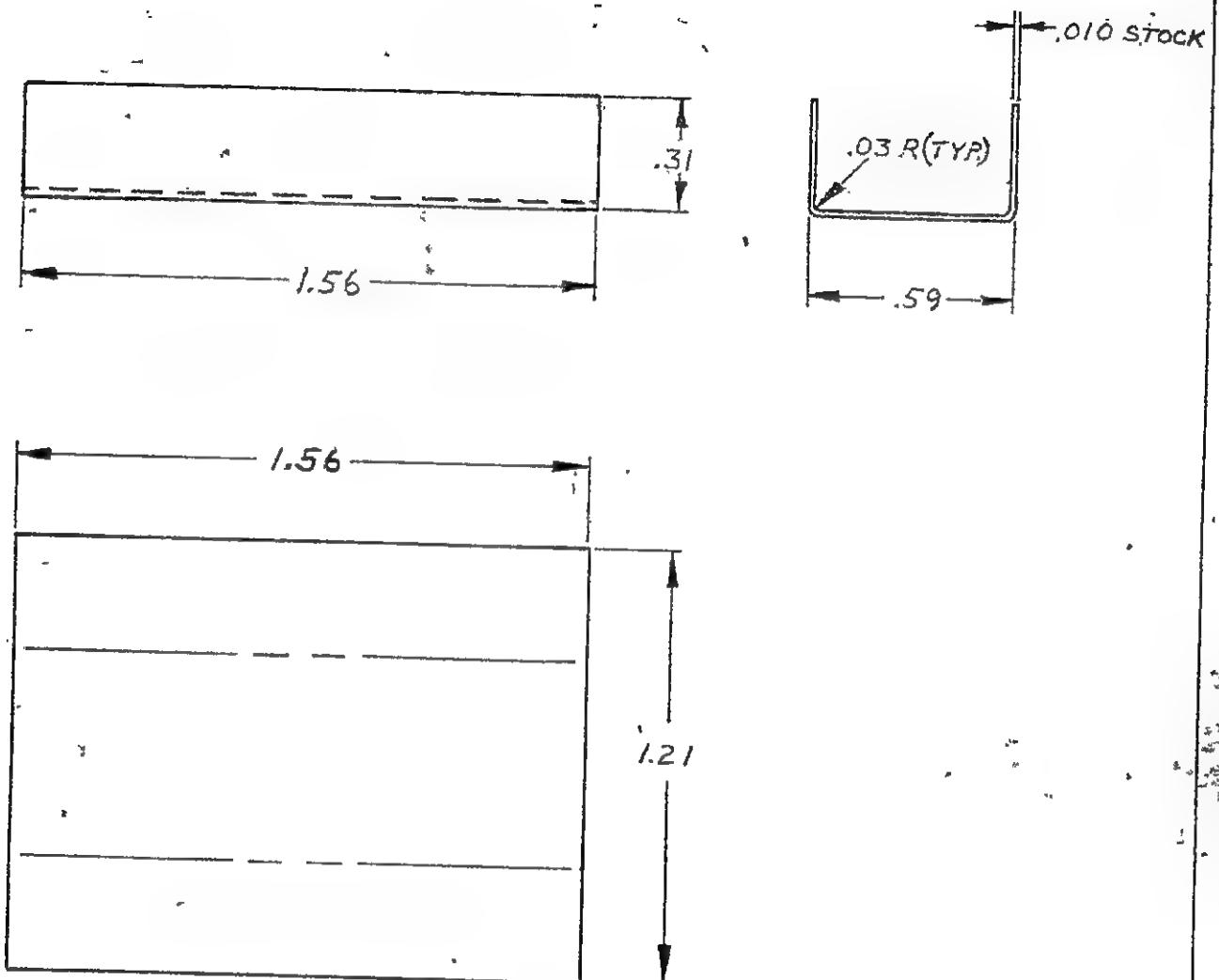


Figure 3-2. 8-Track Sync Panel, Rear Connectors



I/O CONNECTOR WIRING SIDE



FLAT PATTERN

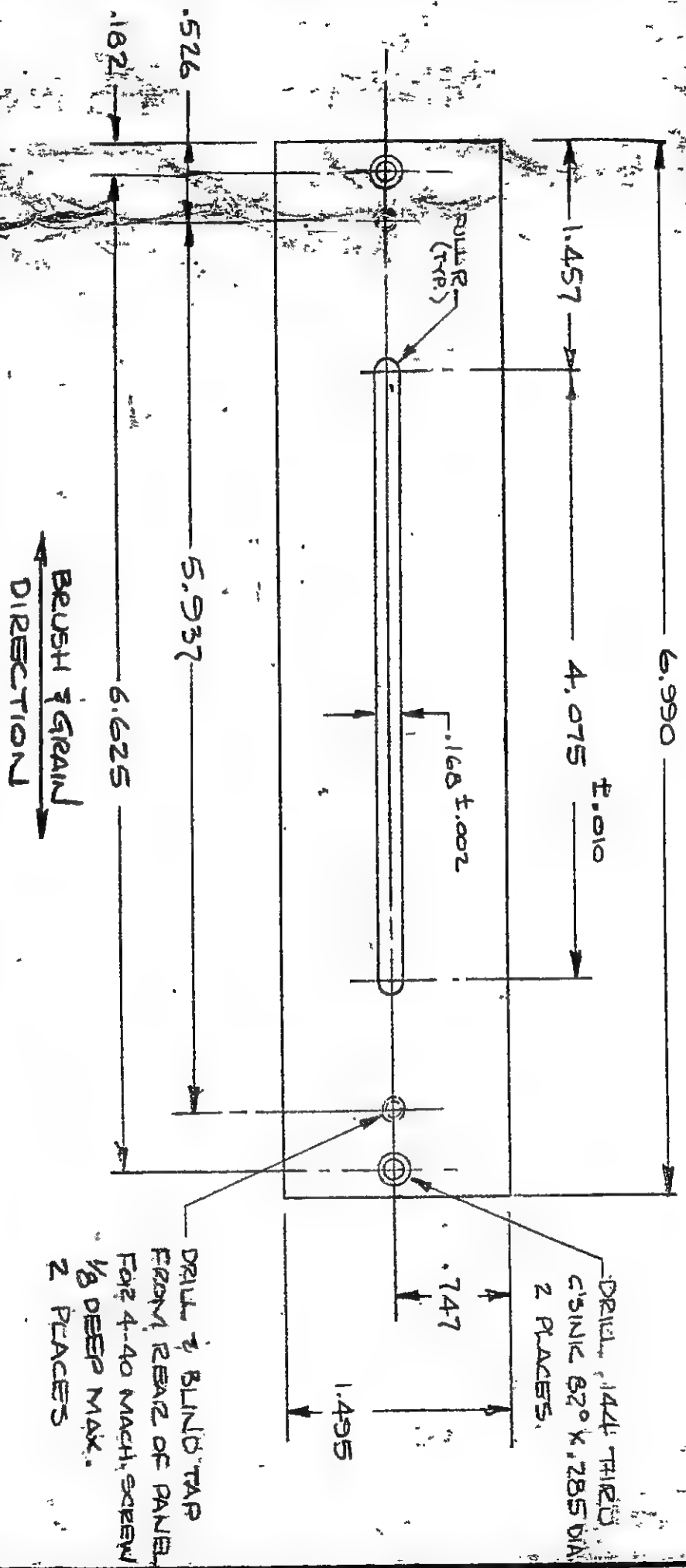
2. BREAK ALL SHARP EDGES

1. TIN PLATE PER MIL-T-10727A AFTER FORMING

NOTES:

REVISIONS			STEPHENS ELECTRONICS BURBANK, CALIFORNIA		
NO.	DATE	BY	SHIELD RELAY SOCKET		
A					
B					
C					
D					
E					

DESIGNED BY H. PIROUGH	SCALE 2X SIZE	MAT. SPEC. 1020 STL. SH
CHECKED BY L. Leigh	DATE 8/22/73	DRAWING NO.
TRACED	APP'D	110909



KXX = ±.005

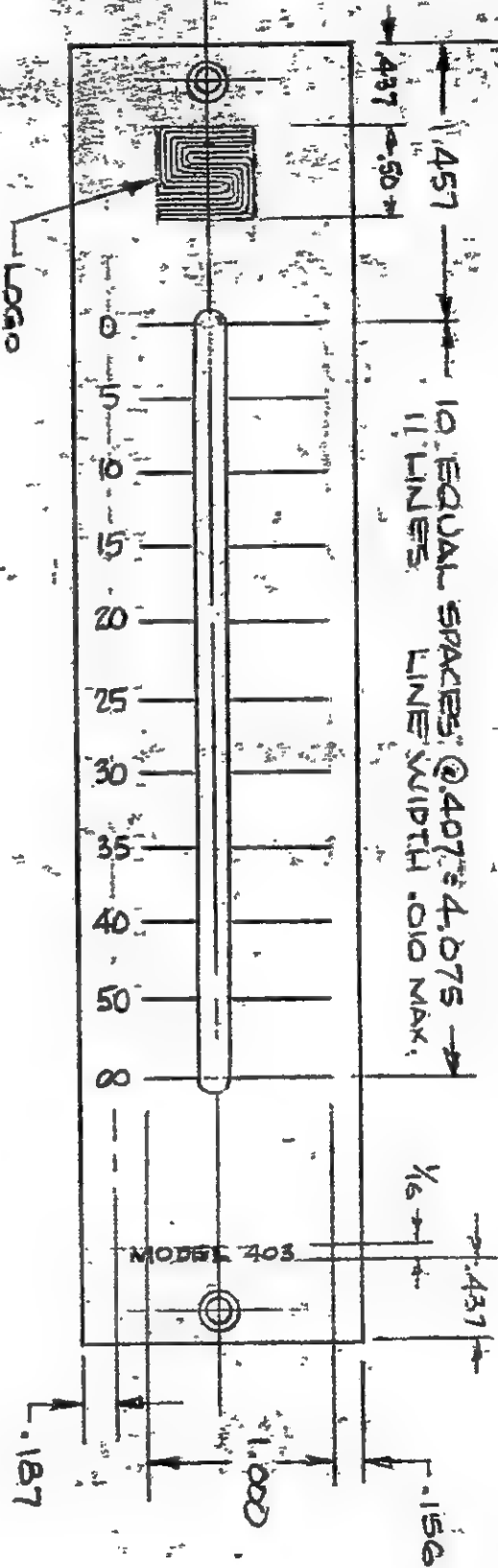
STEPHENS ELECTRONICS, INC.

SCALE: FULL	APPROVED BY:	DRAWN BY: G. G. G.
DATE: 12/21/70		REVISED

PLATE - FACE (FABRICATION)

ATTENUATOR - MODEL 403

DRAWING NUMBER 130021



ENGRAVE AFTER ANODIZING
SKIN COAT - NO FILL

CHARACTERS 1/8" SEMI-CONDENSED
GRAPHIC CENTERED & LOCATED
AS SHOWN

STEPHENS ELECTRONICS, INC.

SCALE: FULL

APPROVED BY:

DATE: 12/22/70

DRAWN BY G. G. G.
REVISED

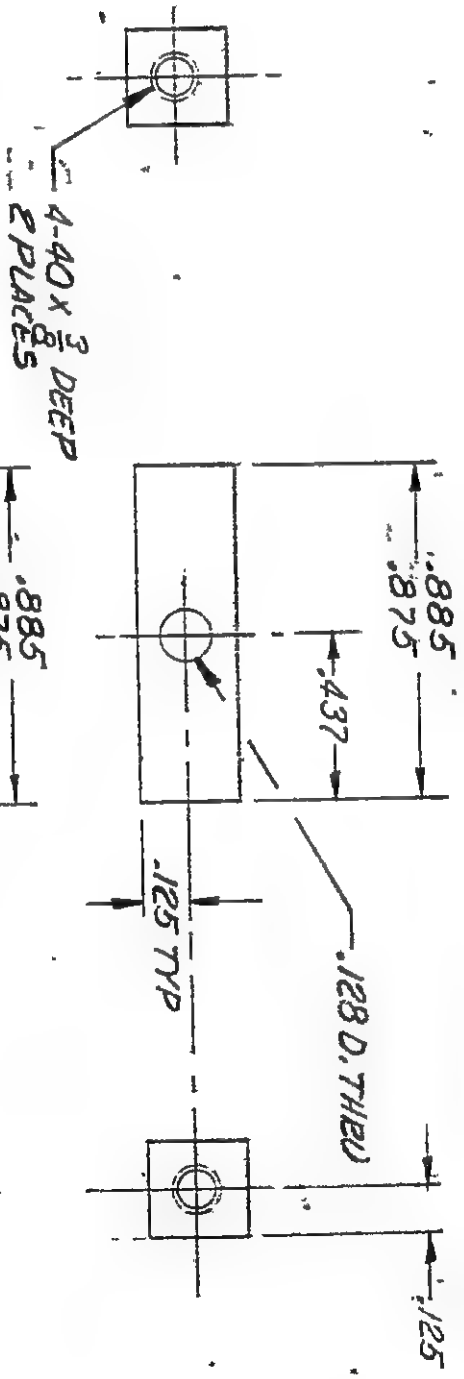
RATE - FACE

(ENGRAVING)

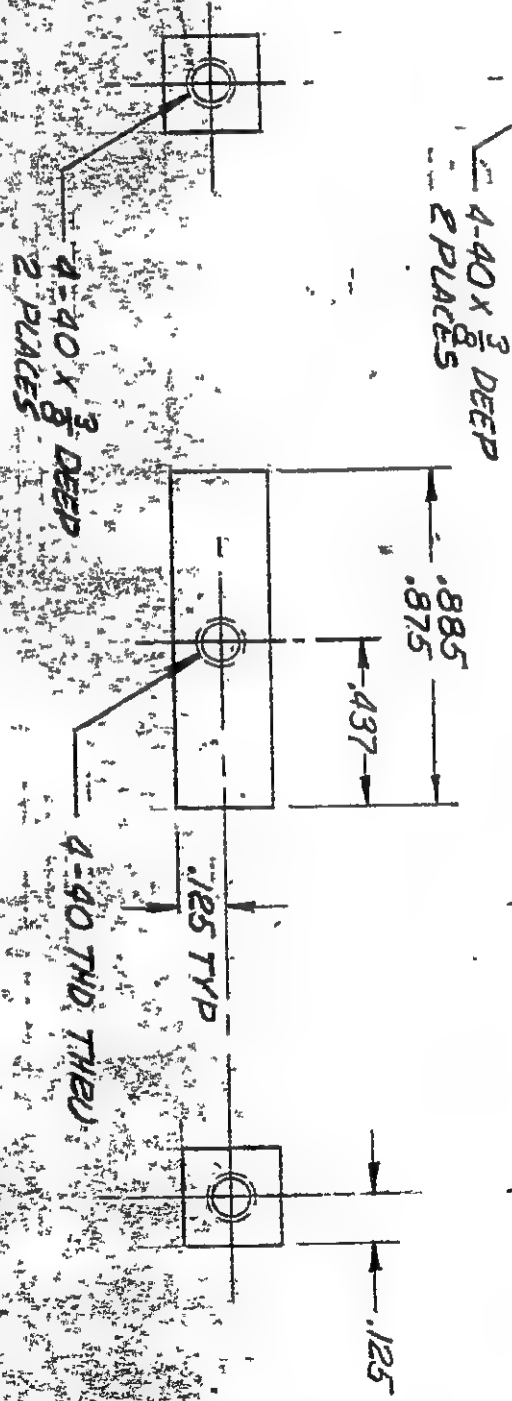
ATTENUATOR - MODEL 403

DRAWING NUMBER
130022

TYPE "A"
2 REQ/UNIT



TYPE "B"
1 REQ/UNIT



MATERIAL: 1/4" 50 STOCK, 2024 T4 OR 2017-T4
FINISH: ANODIZE 1200 OR 1E DITE

SPACER

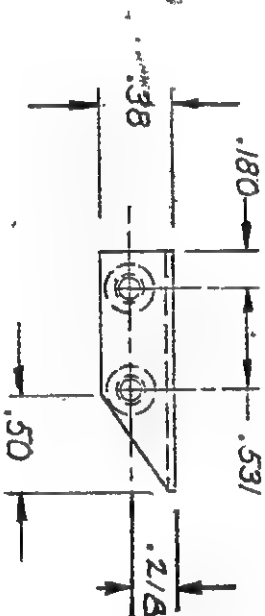
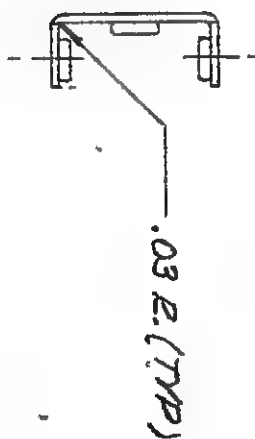
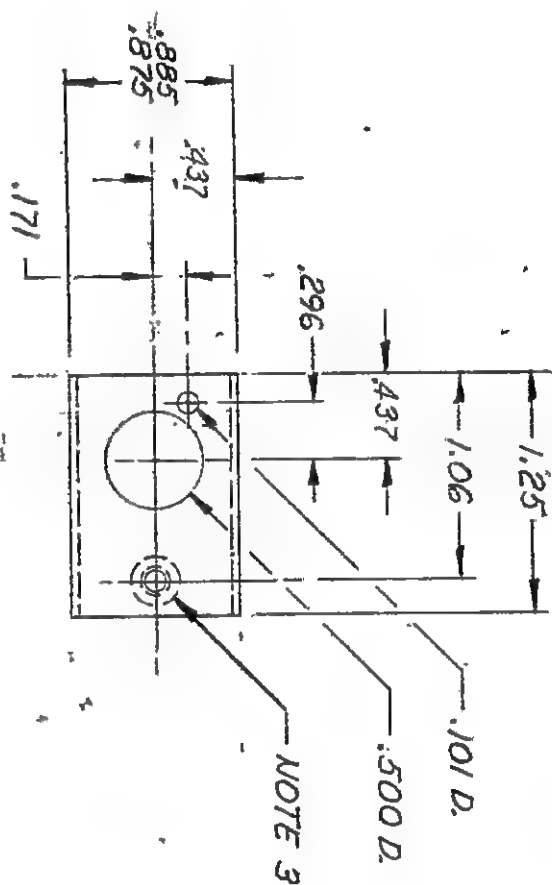
XXX ± .005

STEPHENS ELECTRONICS
BUREAU, CALIF. 842-5116

DESIGN: D. DUNN 1-14-65
SCALE: 2:1

130025

XX = $\pm .020$
 .XXX = $\pm .010$



BRACKET, CONNECTOR
 FULL SCALE
 DESIGN: W. D. Dwyer 1-7-65

3. INSTALL 4-40 CLINCH-TYPE NUTS, AS SHOWN (5 PLACES)
2. FINISH: CADMIUM, PL.

1. MAT'L: .040, C1010 STL.

NOTES:

STEPHENS ELECTRONICS

2302 N. ONTARIO BL.
 BURBANK, CALIF.

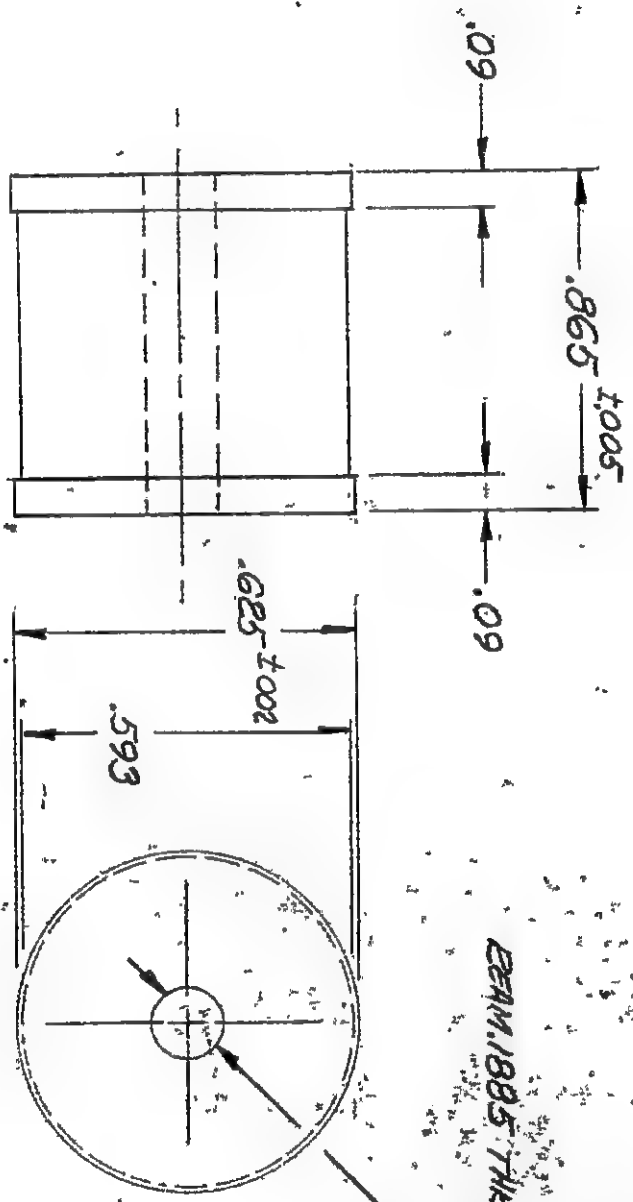
B42-5/16

130026

REVISIONS

A WAS 4 REQ/UNIT 9/23/70

TEAM 1885 THRU



NOTES:

1. MATL: NYLATEON ROD
2. BREAK SHARP EDGES

① 2 REQ/UNIT

.XX = $\pm .02$
.XX = $\pm .010$

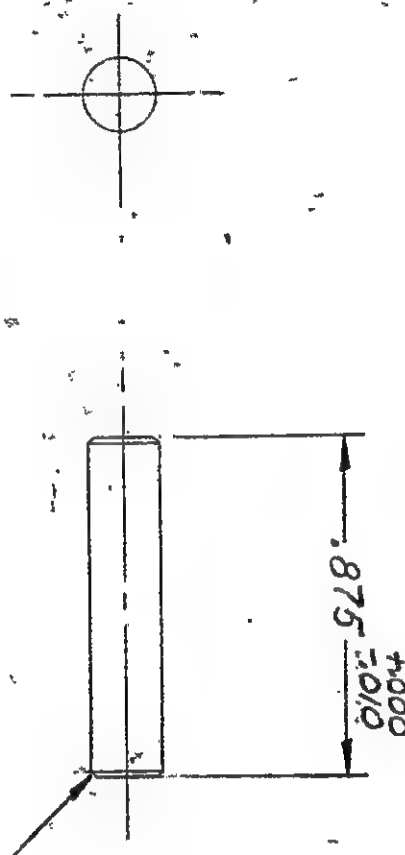
POLLER

REV A 9/23/70

STEPHENS ELECTRONIC
BUEBAUCALIF. 842-5116

DESIGN: D. Russell H-14-65
SCALE: 2:1

130027



MATL: CRES. 18-8 TYPE 303 COND. A
 (MAKE FROM DOWEL PIN.)

ROLLER SHAFT

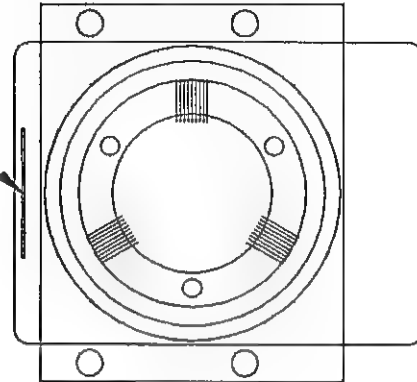
STEPHENS ELECTRONICS
 BUEBAK, CALIF. 942-5116

DESIGN: N. Dandy 1-14-65
 SCALE: 2:1

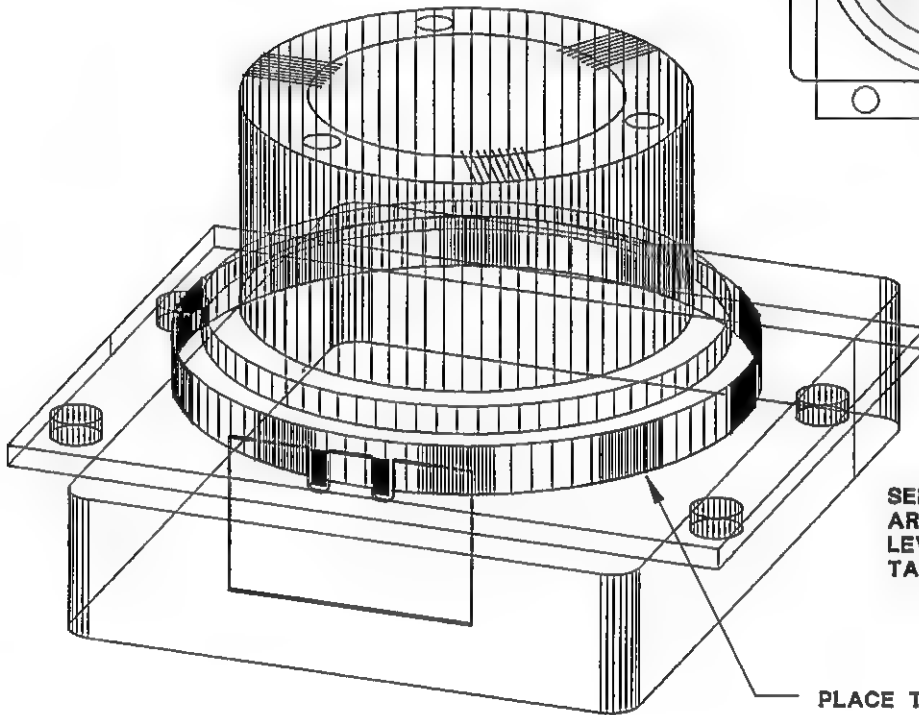
4 REQ/UNIT

130028

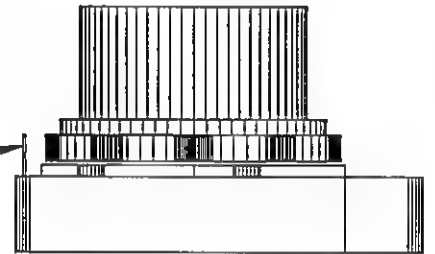
LEFT REEL MOTOR



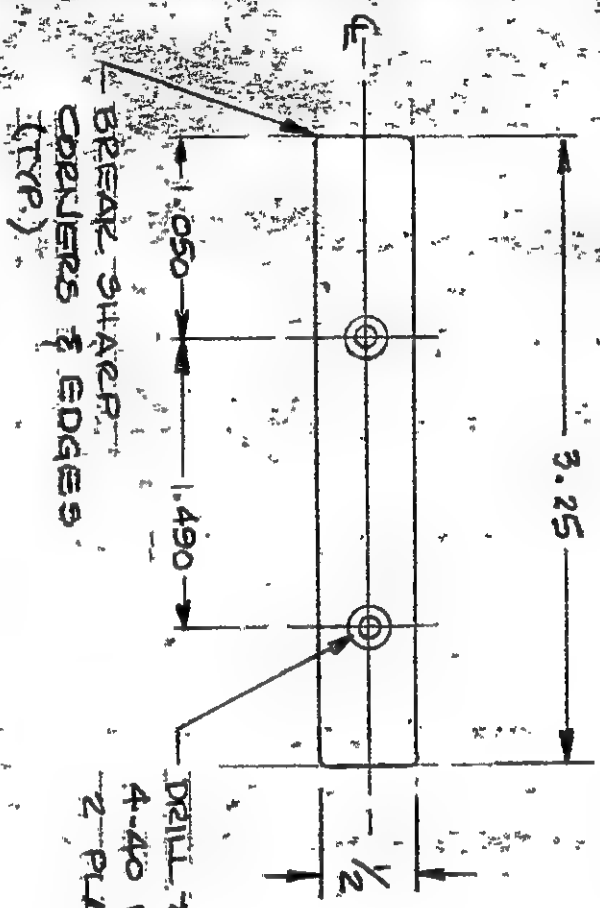
PLACE SENSOR ON SIDE OF DECK FRAME



SENSORS
ARE
LEVEL WITH
TABS



PLACE TABS AROUND HUB



DRILL 7/16 DIA. FOR
4-40 FL. HD. M.S.
2 PLACES

MAT'L: ALUM 1/8 THICK
FINISH: BLACK ANODIZE

STEPHENS ELECTRONICS, INC.

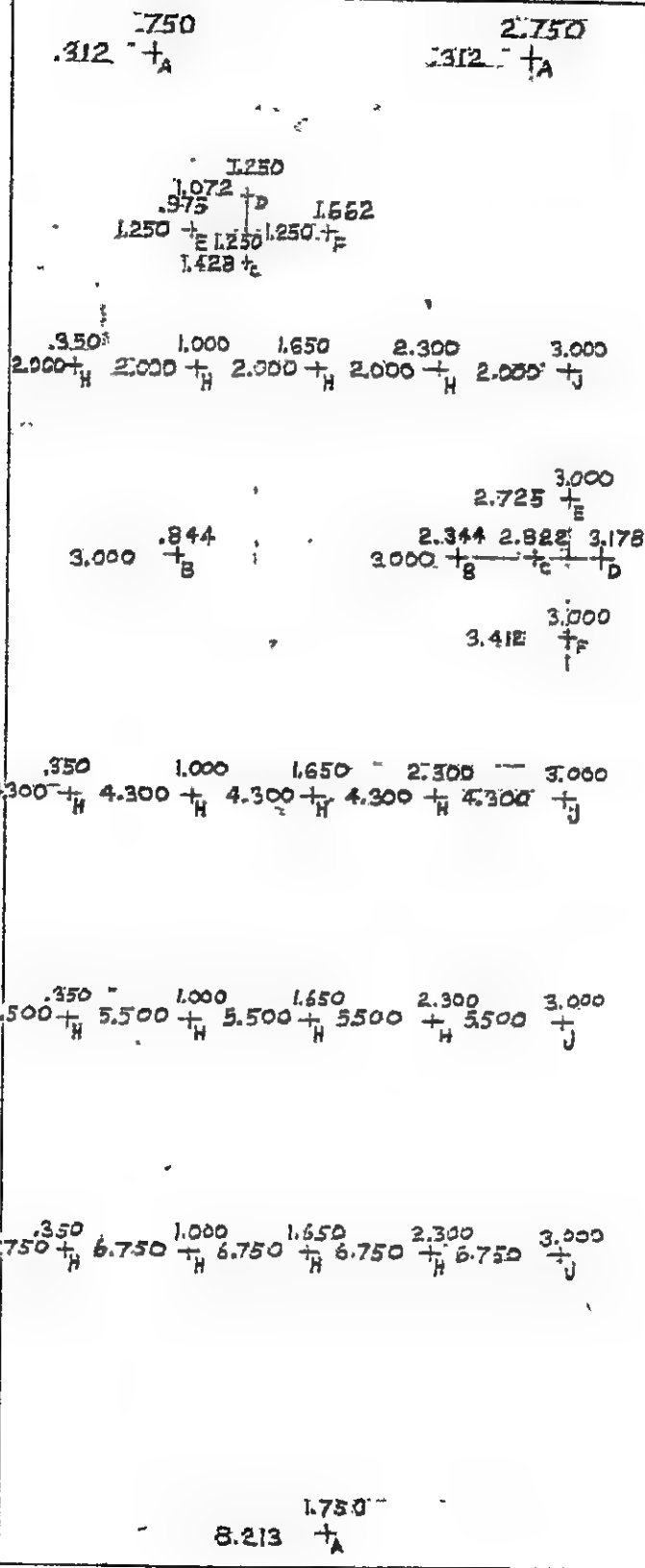
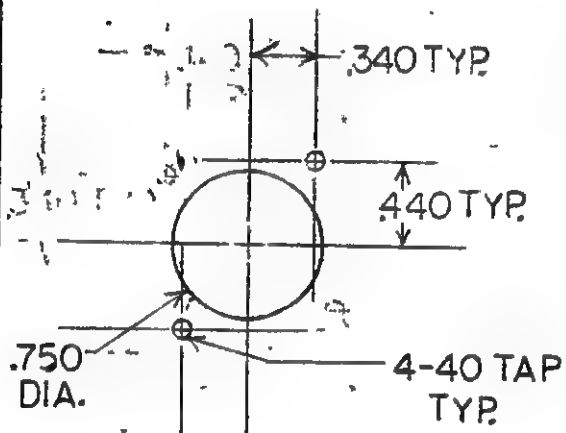
SCALE: FULL	APPROVED BY: 	DRAWN BY: C. G. B. 
DATE: 6/15/74		REVIEWED: 

HANDLE - ELECTRONICS CHASSIS

MODEL 4400

DRAWING NUMBER
10958

A- .156 DIA.
 B- .120 DIA.
 C- 4-40 TAP
 D- .125 DIA.
 E- .250X .656
 F- .562 X .656
 H- .250 DIA.
 J- SEE DETAIL



STEPHENS ELECTRONICS

SCALE: FULL

DATE: 1-13-70

APPROVED BY:

DRAWN BY DMS

REVISED

811C-4100

CHASSIS

DRAWING NUMBER

110931

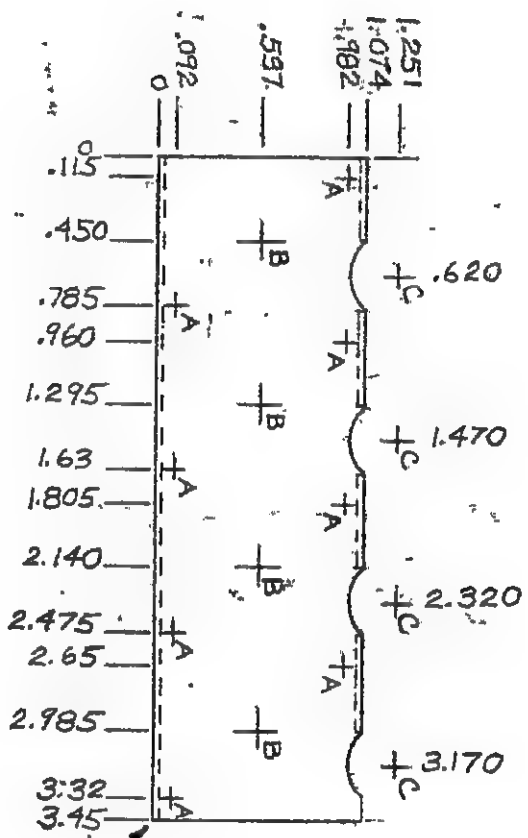
MAT'L 6061-T4 .090 THK.

XX±.005

XXX±.001

REMOVE ALL BURRS

A DRILL TAP FOR 4-40
 B .750 DRILL
 C .265 RADIUS



BEND 90°
 TWO PLACES

MAT'L .032 TIN PLATE .XXX ± .005

STEPHENS ELECTRONICS, INC.

SCALE: FULL

DATE: 3-30-73

APPROVED BY:

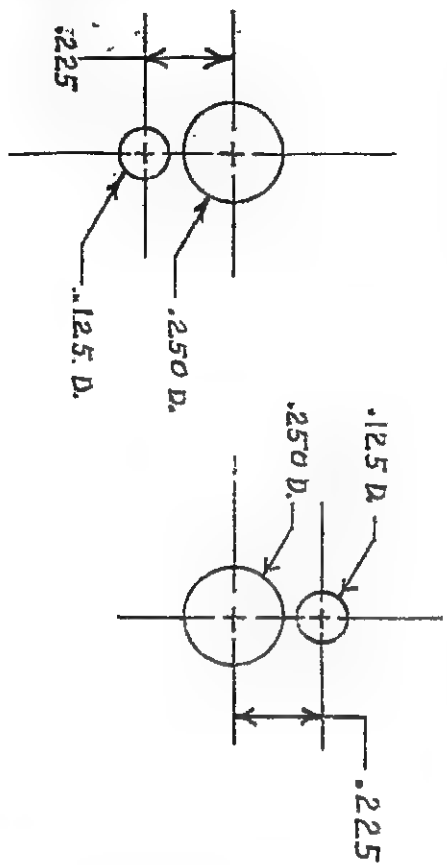
DRAWN BY SRS

REVISED

PLATE - SOCKET HOLD DOWN

DRAWING NUMBER


110964

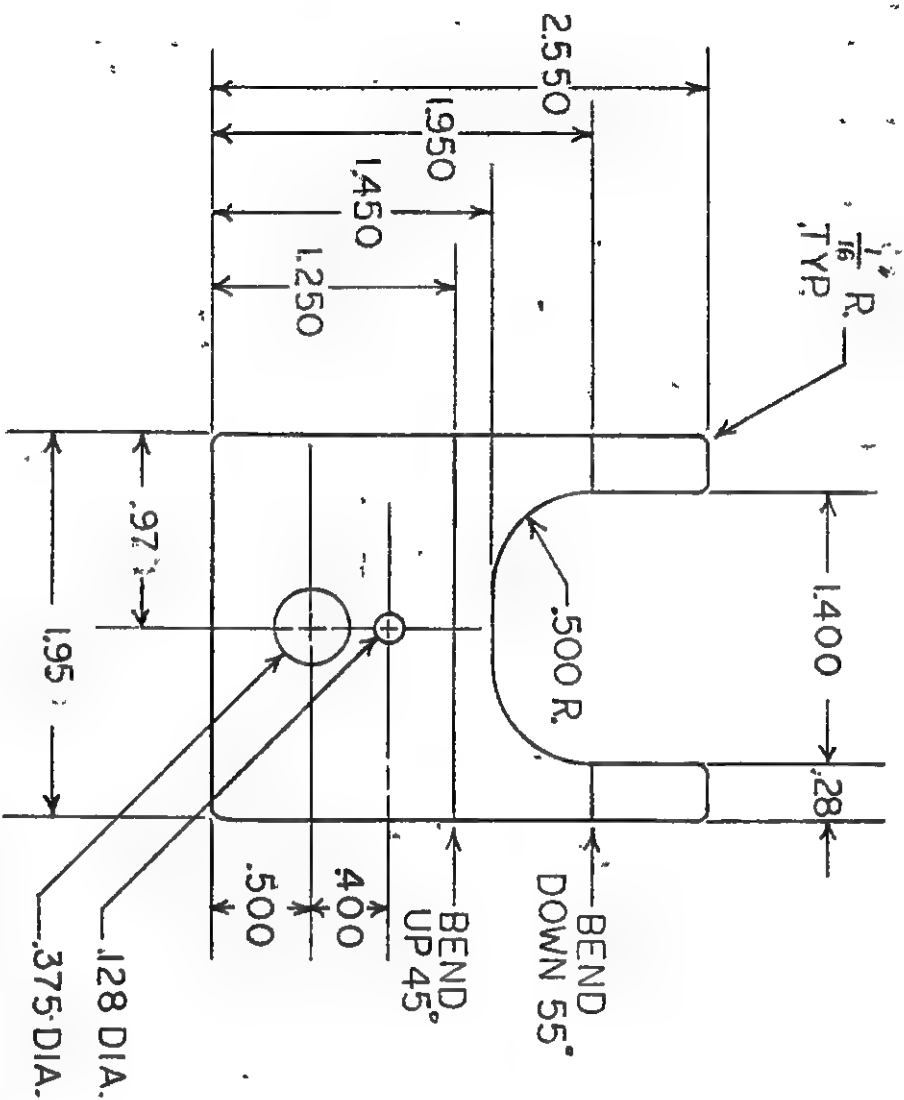


DETAIL "B"

MAT'L -.025 THK. 6061-T6

A - SEE DETAIL "A"
B - SEE DETAIL "B"
C - 375 D. 375
D - 250 D. 250
XXX 4.005

SCALE: FULL		APPROVED BY: 	
DATE: 8-18-70		DRAWN BY: <i>20md</i>	
4200 BACK PLATE		REVISIED	
DRAWING NUMBER: 110943			



.XXX±.005 .XX±0.5° MATL.065 THK. 6061-T6

STEPHENS ELECTRONICS

SCALE: FULL

APPROVED BY:

DATE: 11-4-69

DRAWN BY DMS

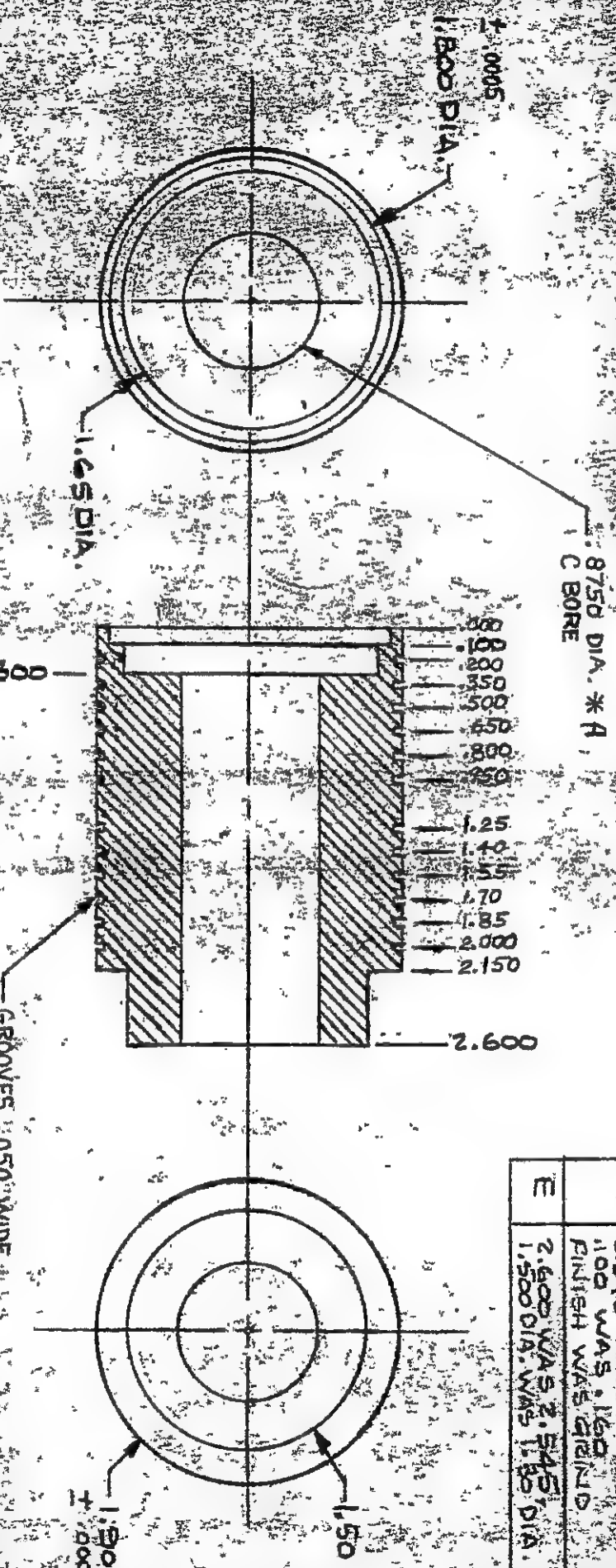
REVISED

VU METER RETAINING CLIP

DRAWING NUMBER

110505A

REMOVE ALL BURRS AND ROUGH EDGES



REVISIONS	
SYM	DESCRIPTION
D	1.65 DIA. WAS 1.500 DIA. 1.50 DIA. WAS 1.45 DIA. ADDED 1.800 DIA. T. 1.500 2.545 WAS 2.285 1.00 WAS 1.60 FINISH WAS GRIND
E	2.600 WAS 2.545 1.500 DIA. WAS 1.65 DIA.

MAT'L: T-6061 ALUMINUM

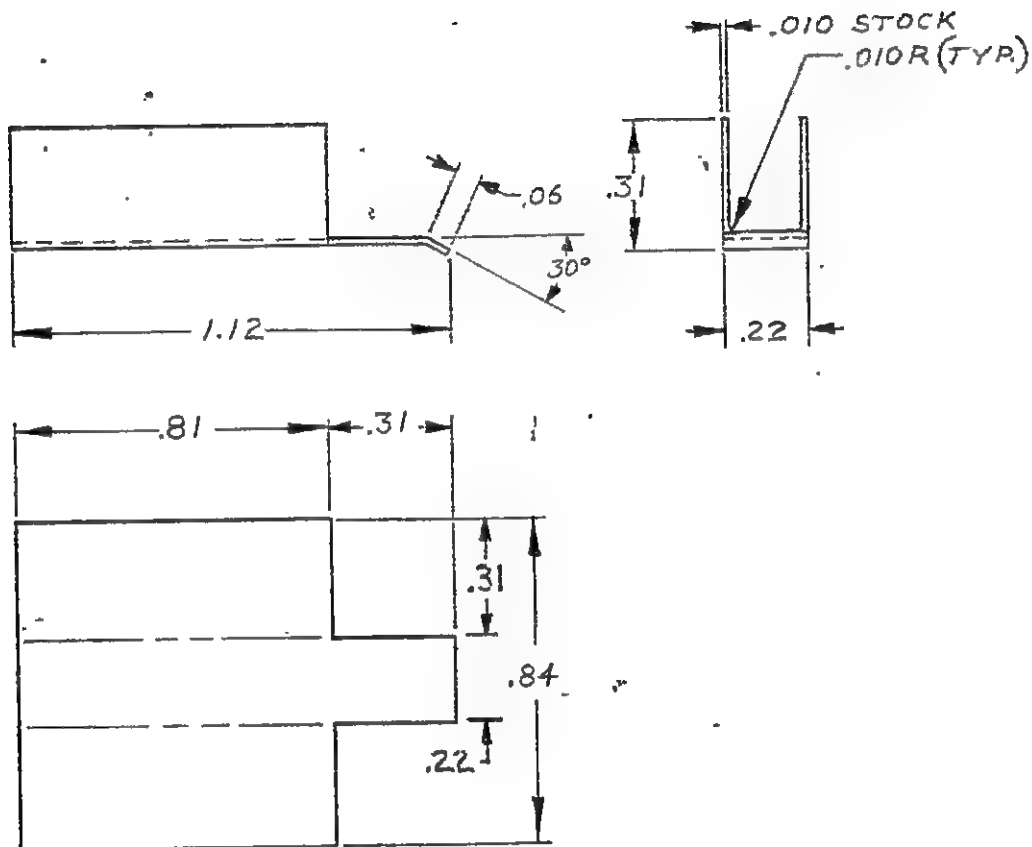
STEPHENS ELECTRONICS, INC.

SCALE: FULL	APPROVED BY:
DATE: 3-26-73	<i>[Signature]</i>
DRAWN BY: SRS	REVISOR:

REVERSE IDLER

* HAND PRESS FIT TO SUPPLIED BEARING
OR BEARING DIA. 1.5000 $\pm .0002$

DRAWING NUMBER
110134 E



FLAT PATTERN.

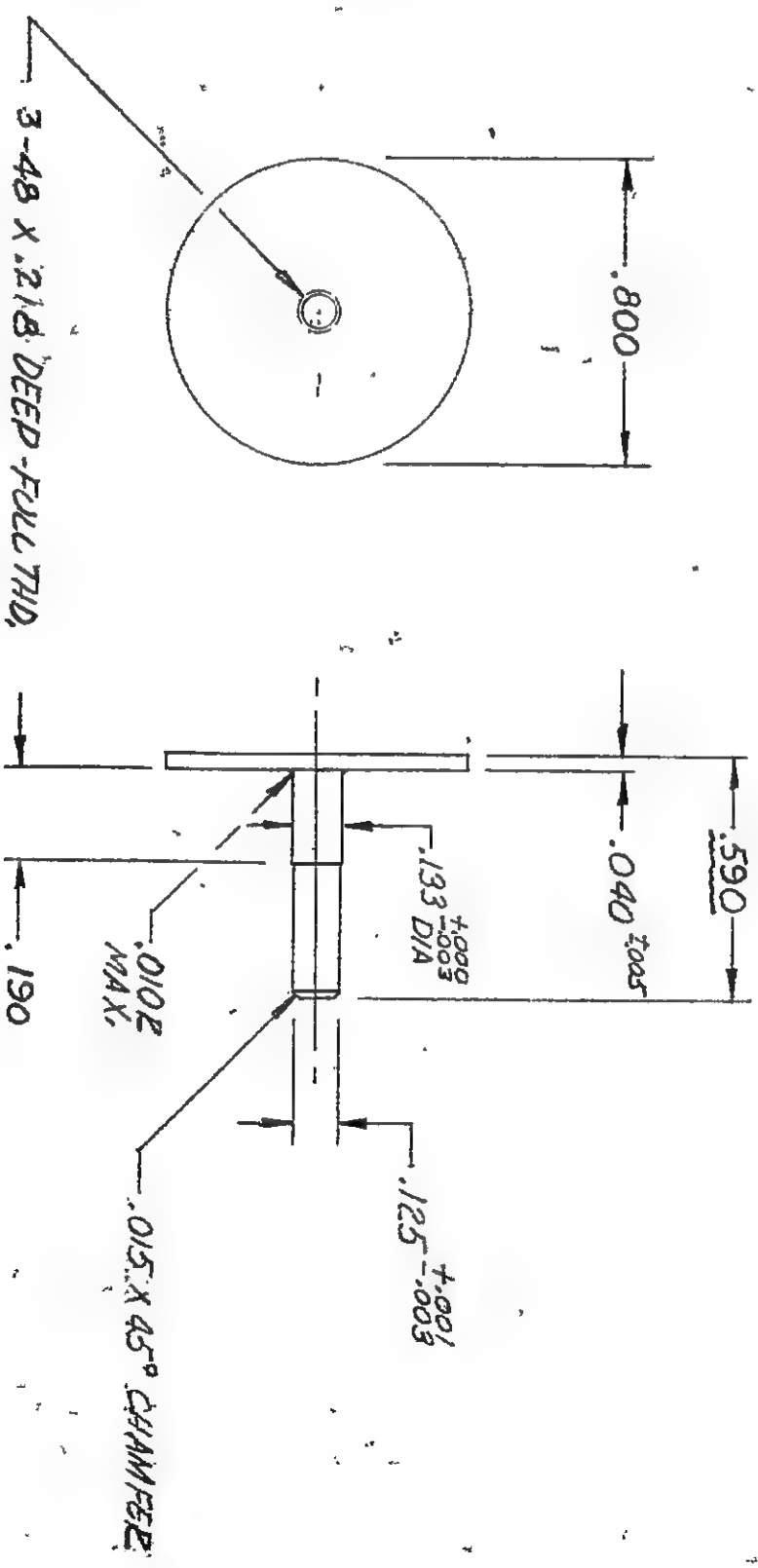
2. BREAK ALL SHARP EDGES

1. TIN PLATE PER MIL-T-10727A AFTER FORMING

NOTES:

REVISIONS			STEPHENS ELECTRONICS BURBANK, CALIFORNIA		
S.	DATE	BY	SHIELD WIRE		
A					
B					
C			<small>W. BY</small> H. PIRROUGH <small>CHK'D</small> J. Leigh <small>TRACED</small>	<small>SCALE</small> 2X SIZE <small>DATE</small> 8/22/73 <small>APP'D</small>	<small>MAT. RIAL</small> 1020571 SH <small>DRAWING NO.</small> 110910
D					
E					

REVISIONS
 A1 .590 WAS .650
 .190 WAS .250
 3-48 WAS 4-40 THD.
 7/6/71 JG



2. FINISH

1. MATERIAL: 60-40 BRASS

NOTES: UNLESS OTHERWISE SPECIFIED

1.000/UNIT

SHAFT

REV A 1/4/71

STEPHENS ELECTRONICS

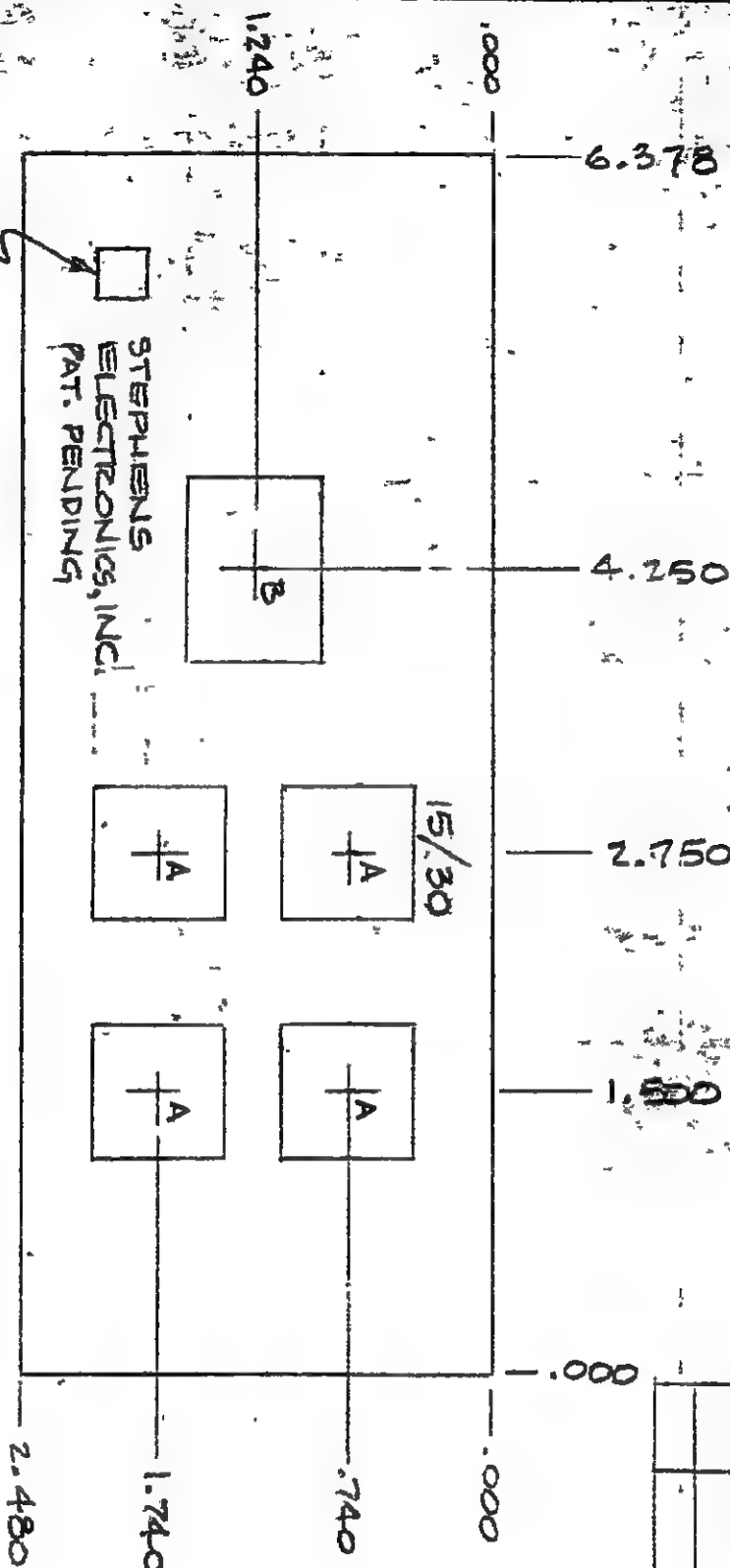
BUEBAK, CALIF. 842-5116

DESIGN: W. Russell 1-16-65

SCALE: 2:1

130032

REVISIONS		
SYM	DESCRIPTION	DATE



STEPHENS
ELECTRONICS, INC.
PAT. PENDING

1960

$$A = .720 \times .720$$

NOTE: HOLE PATTERNS MUST
MATE WITH "B" HOLES IN
PART NO. A10107.

XXXXH
DOOR

MAT'L: .100 THK ALUM 6061-T6
FINISH: ANODIZED & PAINT FACE
ONLY PER FED. STD #26081 DARK GRAY
ENGRAVE 1/8" LETTERS CENTERED
& LOCATED AS SHOWN. FILL WHITE

STEPHENS ELECTRONICS, INC.

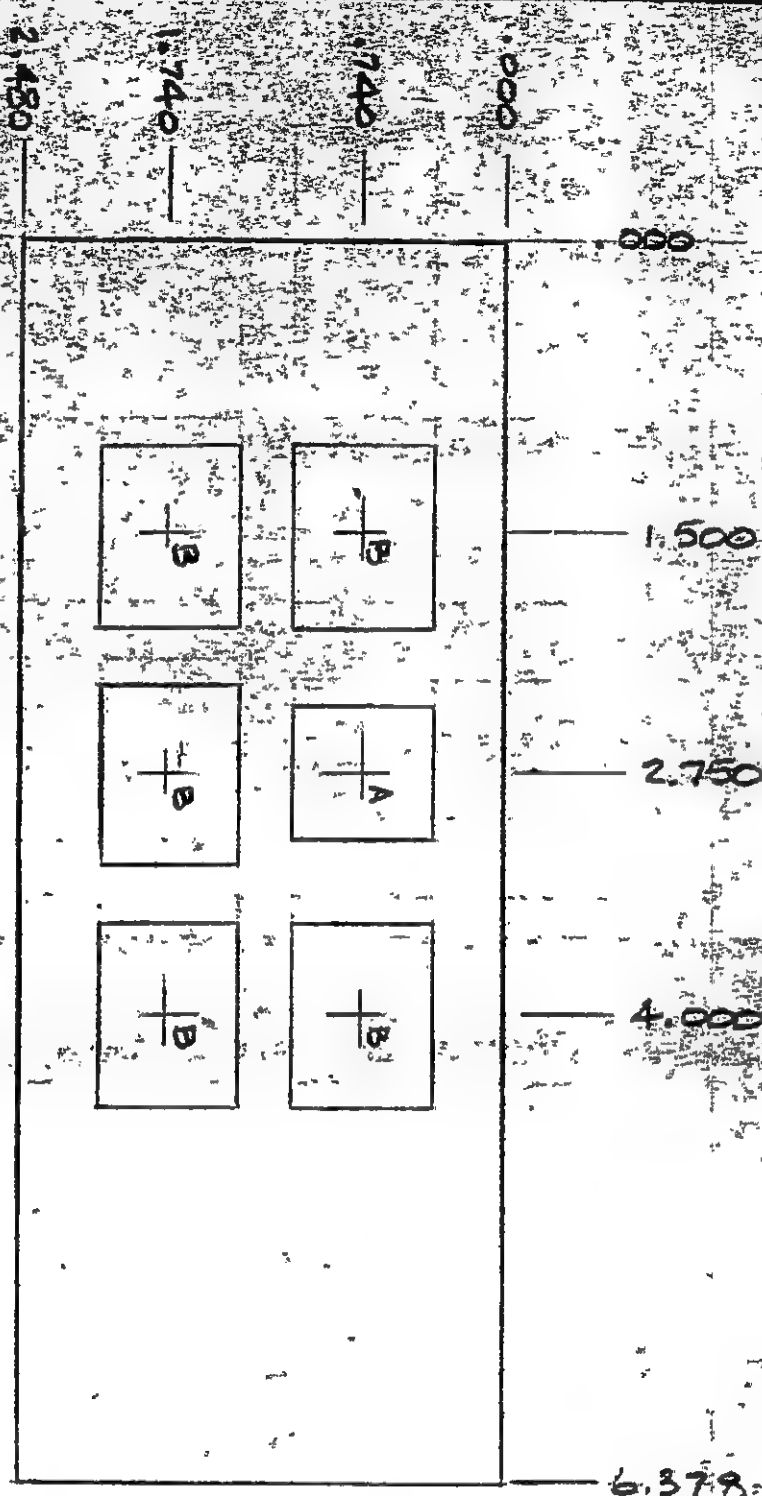
SCALE: Full	APPROVED BY:	DRAWN BY: <i>Geier</i>
DATE: 6/14/71		REVISID

DECK PANEL - LEFT UPPER

910-10

DRAWING NUMBER
110105
REV.

SYM	DESCRIPTION	DATE
-----	-------------	------



FINISH : ALODINE & PAINT FACES ONLY
 PER FED. STD # 26081 DARK GRAY
 MAT'L : .100 THK ALUM 6061-T6

A = .720 X .720
 B = .970 X .720
 NOTE - HOLE PATTERN MUST
 MATCH WITH "B" HOLES
 IN PART NO. A10108.

STEPHENS ELECTRONICS, INC.

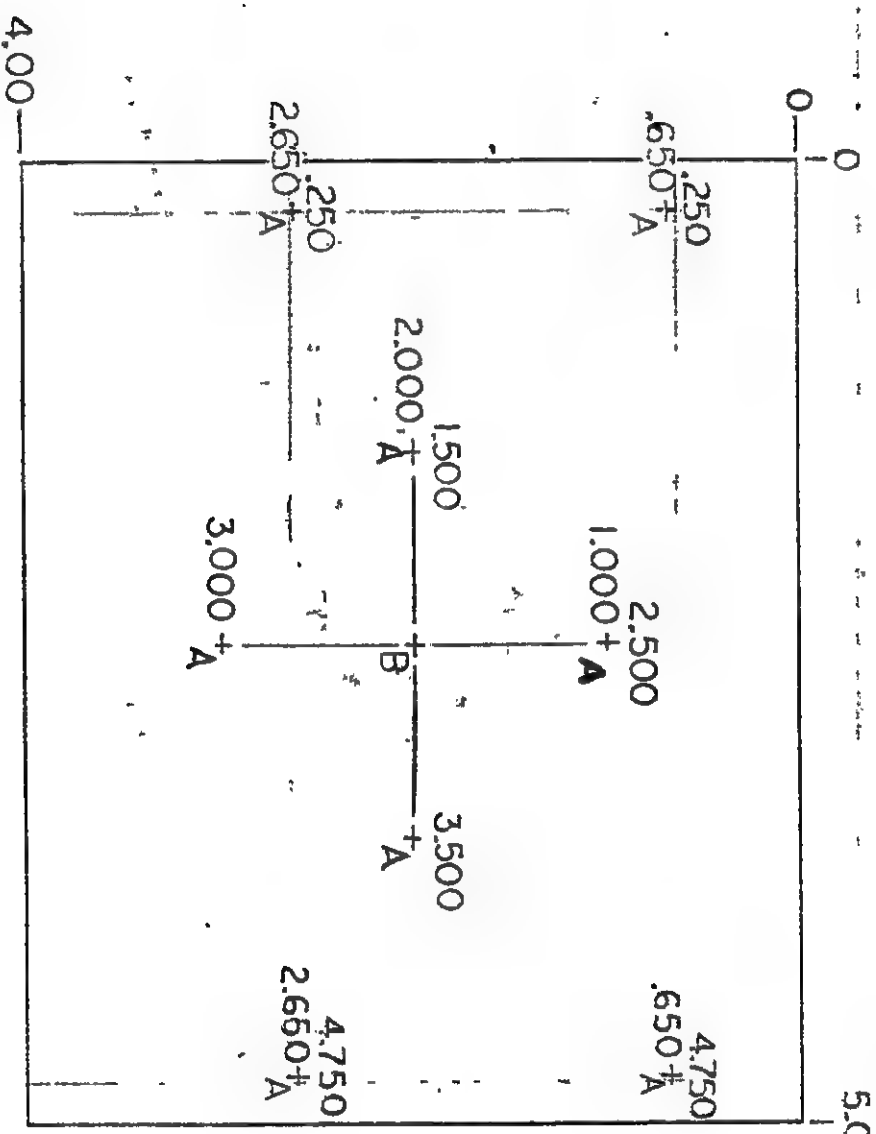
SCALE: FULL	APPROVED BY:	DRAWN BY: GEFER
DATE: 6/14/71		REVISED

DECK PANEL - RIGHT UPPER

811D-103

DRAWING NUMBER 811D-103

REVISIONS		
SYM	DESCRIPTION	DATE
A	B WAS 1.188 DIA.	1/7/74



A - .191 DIA.
B - 1.390 DIA.

MAT'L - 1/8" ALUM. 6061-T6

.XX ± .010 .XXX ± .002

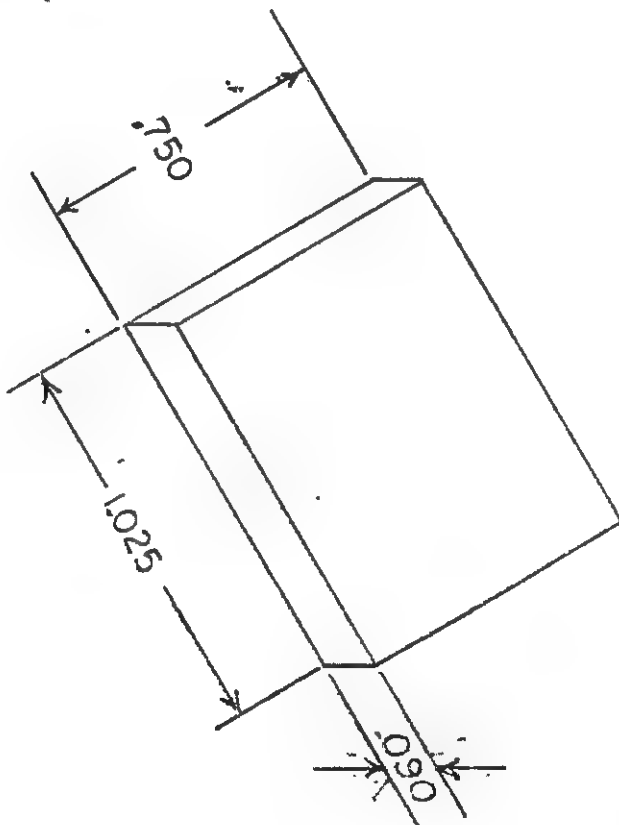
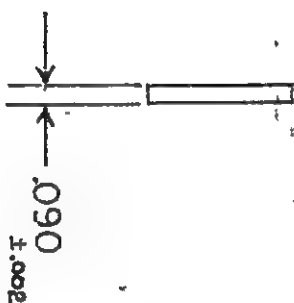
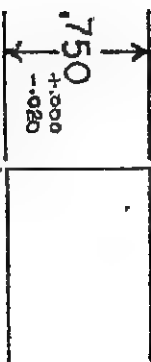
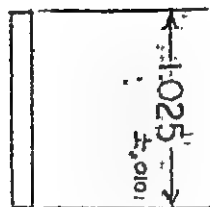
FINISH : ALCOBOND

2 REAR/DECK

STEPHENS ELECTRONICS INC.	
SCALE: FULL	APPROVED BY: <i>[Signature]</i>
DATE: 1/19/72	DRAWN BY: <i>[Signature]</i>
PLATE - REEL MOTOR MTG.	
811D-103	DRAWING NUMBER: 110121A

REVISIONS
 STM DESCRIPTION
 A MATL WAS 3E2A
 B MATL WAS 3C4

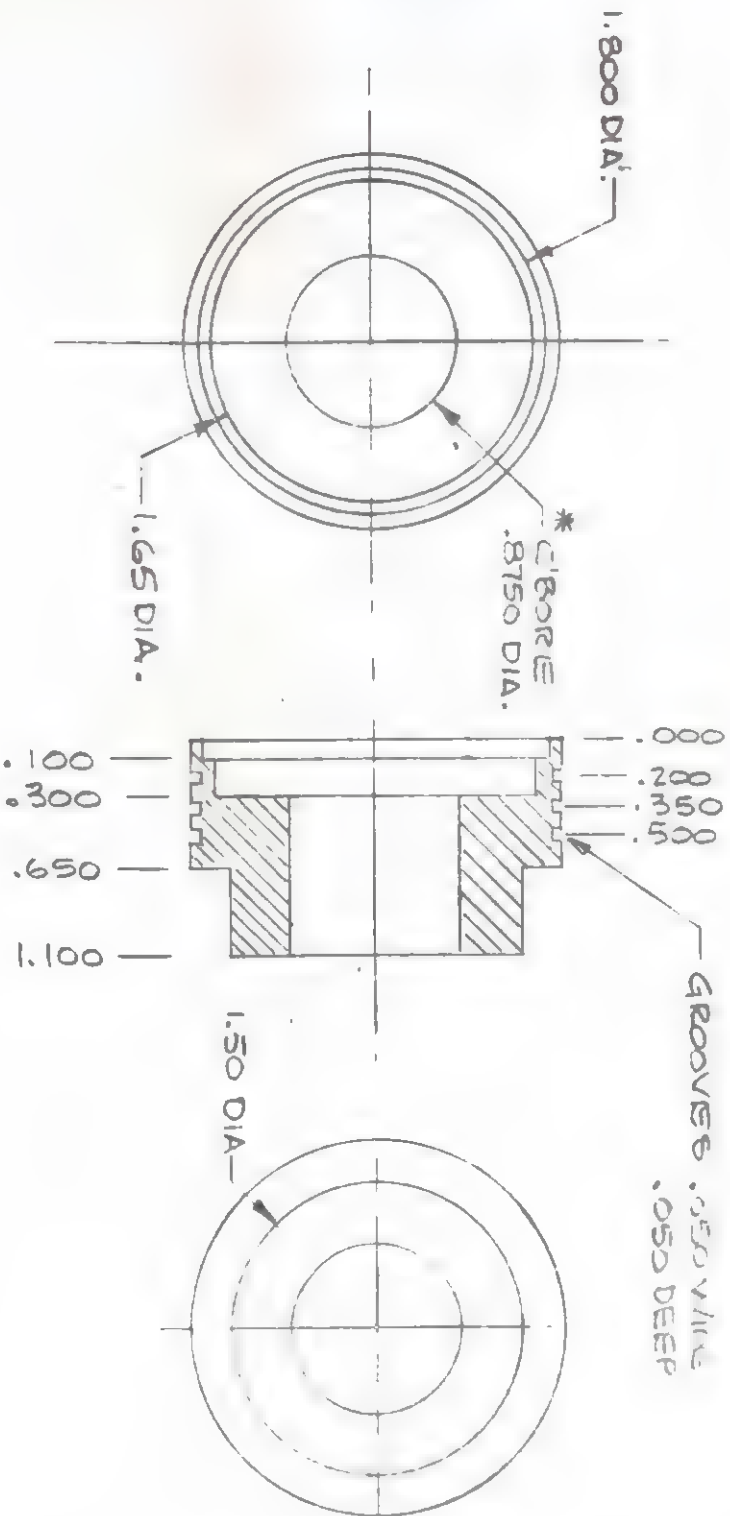
DATE
 8/7/71
 1/4/74



OPPOSITE SIDES PARALLEL ±.001
 LARGE SIDES FLAT ±.001

MATL: INDIANA GENERAL OS OR EQUIV

STEPHENS ELECTRONICS, INC.	
SCALE: FULL	APPROVED BY: <i>[Signature]</i>
DATE: 1/21/72	DRAWN BY DMS
HEAD SHIELD CUBE	
B11D - 103	DRAWING NUMBER 110138 A



CONCENTRICITY $\pm .0002$
 FINISH: SANDBLAST O.D.
 REMOVE ALL BUEBS & ROUGH EDGES
 * HAND PRESS FIT TO SUPPLIED BEARING

MAT'L: 304 STAINLESS

.XX = $\pm .010$.XXX = $\pm .005$ DIA. $\pm .0005$

STEPHENS ELECTRONICS, INC.

SCALE: FULL

APPROVED BY:

DRAWN BY: J.E. 10187

DATE: 6/27/74

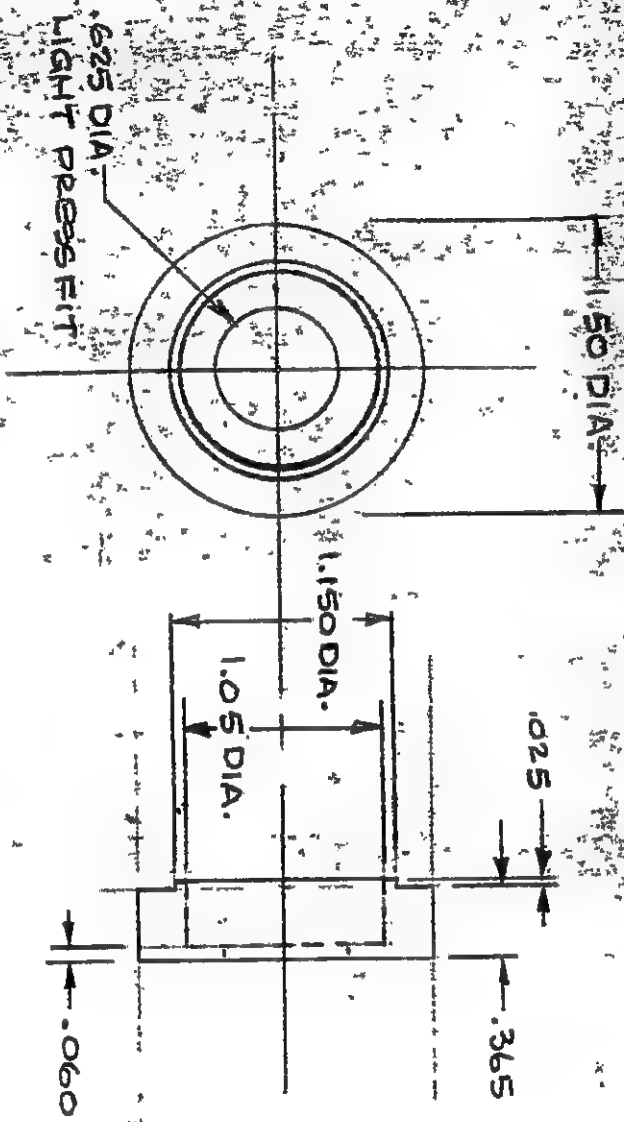
REV. 1

REVISED

REVERSE 10LIER - 1/2 INCH

811D-103

DRAWING NUMBER
110187



MATERIAL: 6061-T6 ALUMINUM

TOLERANCES: XX = $\pm .010$ XXX = $\pm .001$

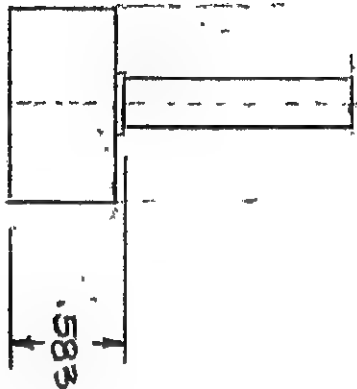
STEPHENS ELECTRONICS, INC.

SCALE: FULL	APPROVED BY: <i>[Signature]</i>	DRAWN BY: <i>[Signature]</i>
DATE: 7/2/74		REVIEWED: <i>[Signature]</i>

ADAPTER - REVERSE IDLER

811 D-103

DRAWING NUMBER
110188



MAT'L: 3M 1" SHAFT
MODIFY EXISTING PART
AS SHOWN

STEPHENS ELECTRONICS, INC.

SCALE: Full

APPROVED BY:

DATE: 7/5/74

[Signature]

DRAWN BY: *[Signature]*

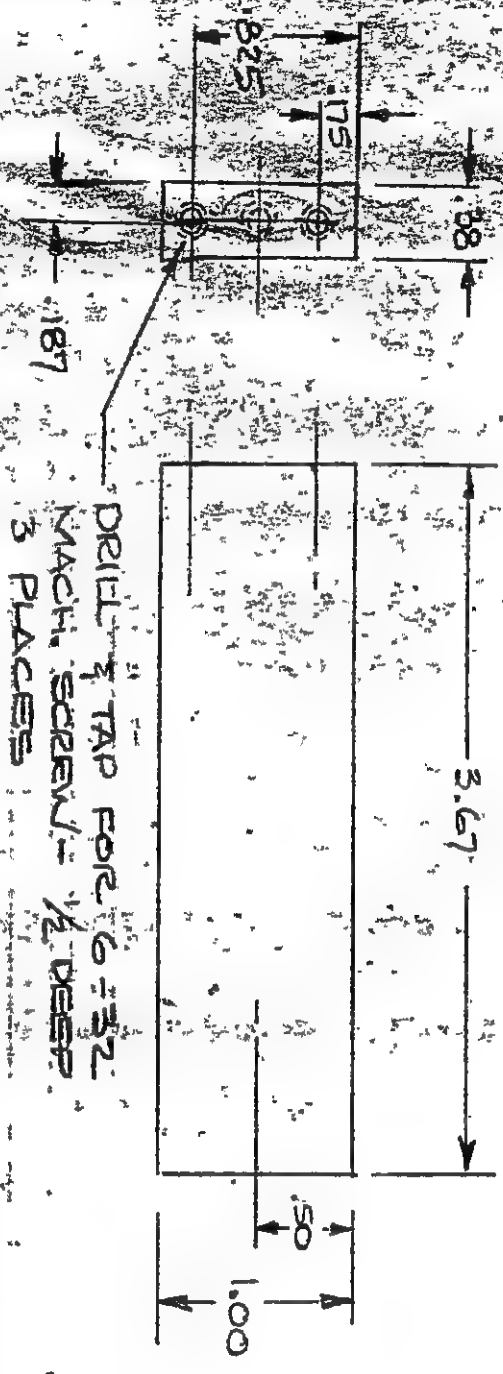
REVISED

MODIFICATION - SHAFT, REVERSE IDLER

DRAWING NUMBER

110189

REV.



DETL 1/4" TAP HOLE
MACH. SCREW 1/2" DEEP
3 PLACES

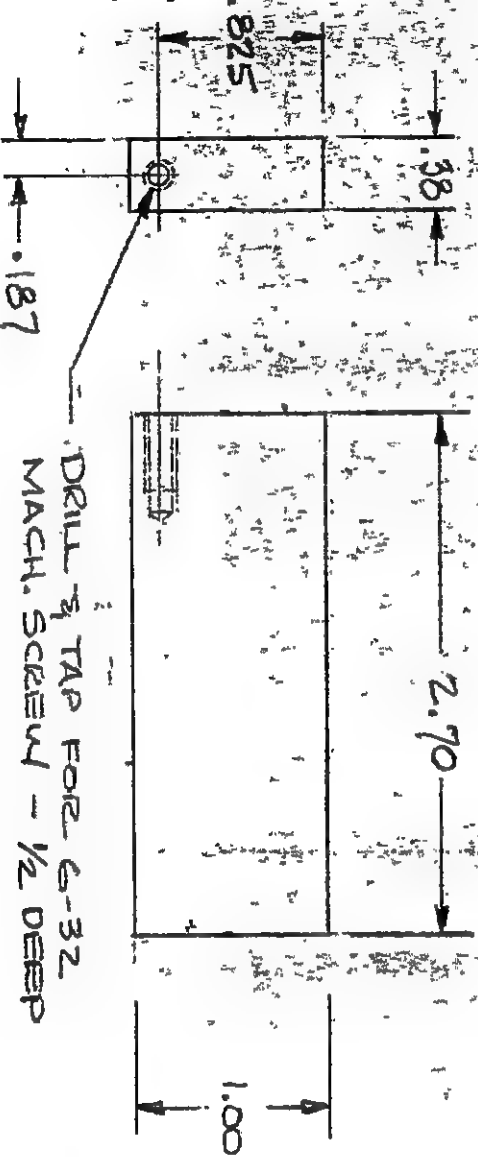
MATL: 6061-T6 ALUM.
FINISH: ANODIZE

STEPHENS ELECTRONICS, INC.

SCALE: FULL	APPROVED BY:	DRAWN BY: G. E. J.
DATE: 9/17/13		REVISED

BRACKET
24/40 CENTER SUPPORT

MODEL: B11D-103
DRAWING NUMBER: 110153-2

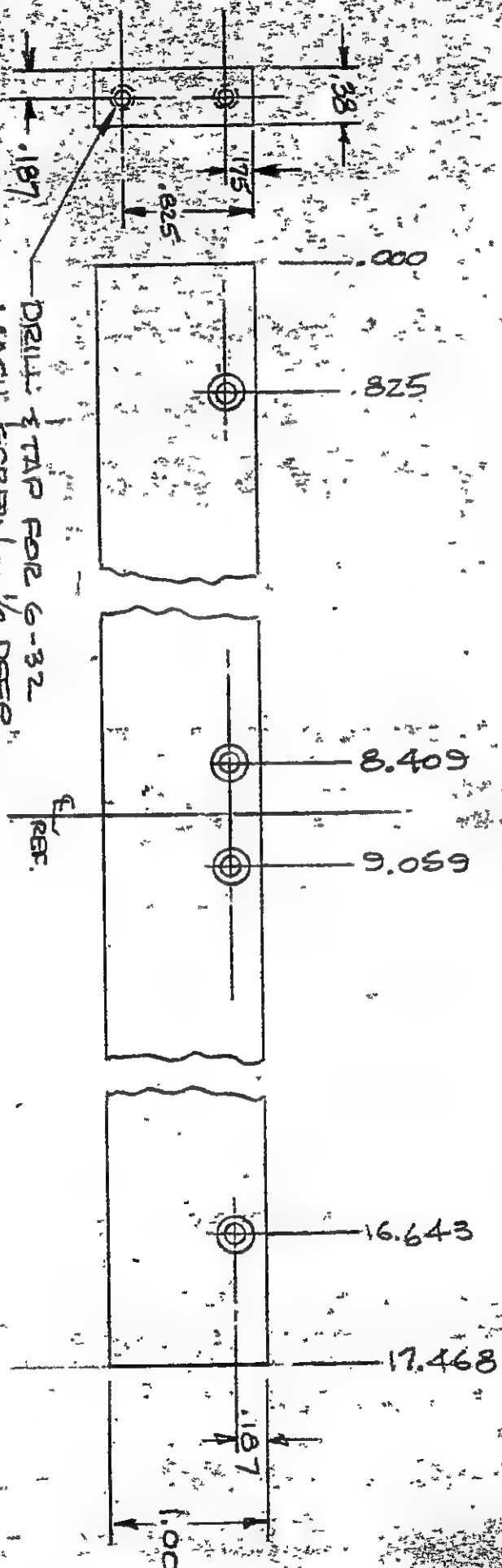


MAT'L: 6061-T6 ALUMIN.
FINISH: ANODIZE

STEPHENS ELECTRONICS, INC.

2 REQ'D/UNIT

SCALE: FULL		APPROVED BY:	
DATE: 5/17/73		DRAWN BY: GIGER	
BRACKET -		REVISED	
24/40 END SUPPORT			
MODEL 8110-103		DRAWING NUMBER	
		T10153-3	



DRILL & TAP FOR 6-32
MACH. SCREW - 1/2 DEEP
2 PLACES TYPE BOTH ENDS

MATERIAL: 6061-T6 ALUM.
FINISH: ALCOXIDE

STEPHENS ELECTRONICS, INC.

SCALE: FULL

APPROVED BY:

DRAWN BY: GEORGE

DATE: 9/17/73

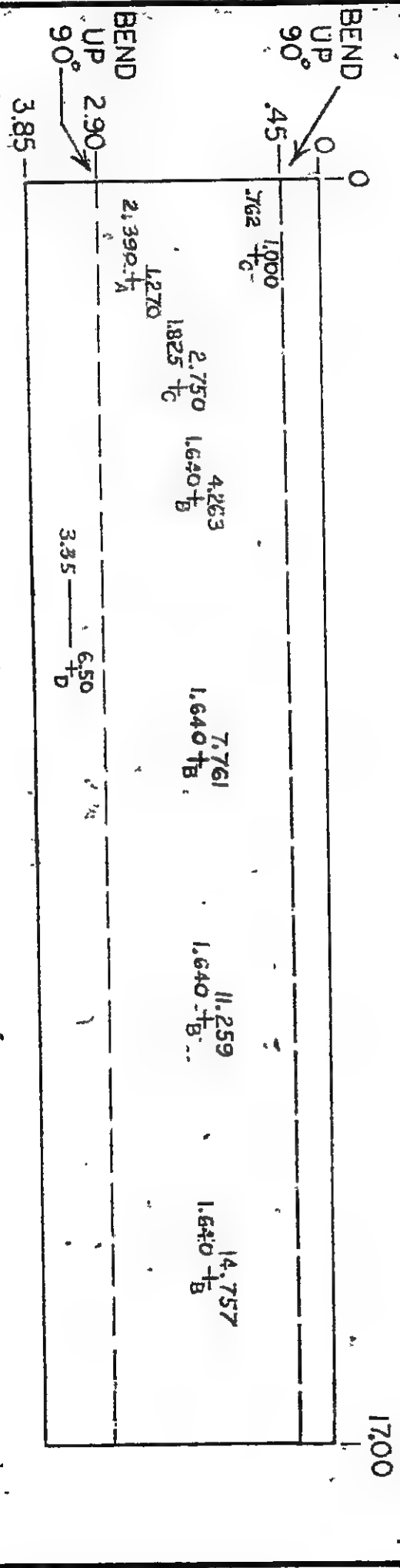
REVISED

BRACKET - 24/40 CROSS SUPPORT

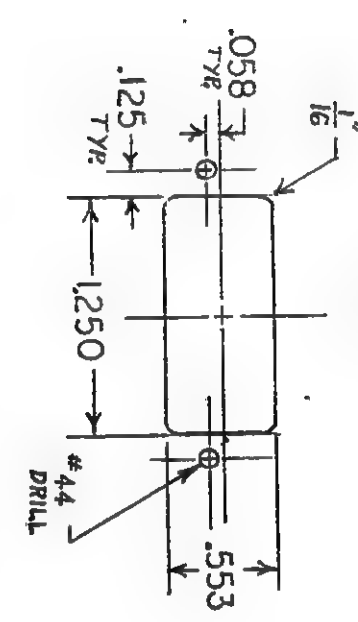
WOPED 811 D-103

DRAWING NUMBER
110153-1

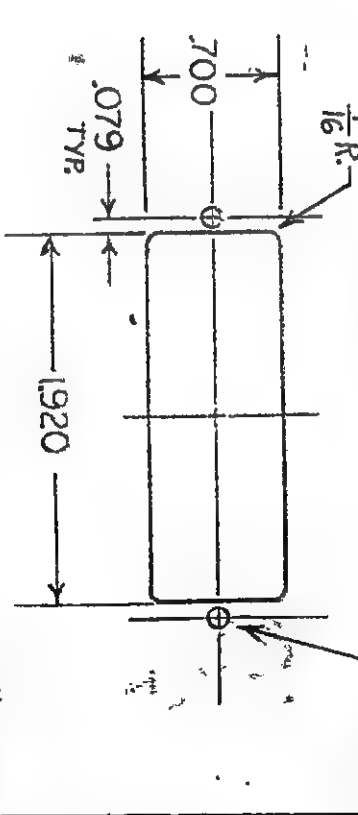
1/DECK



DETAIL B



DETAIL A

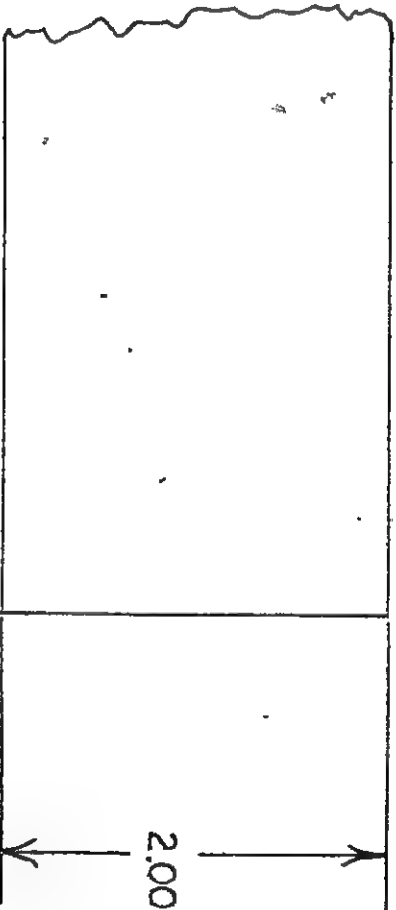
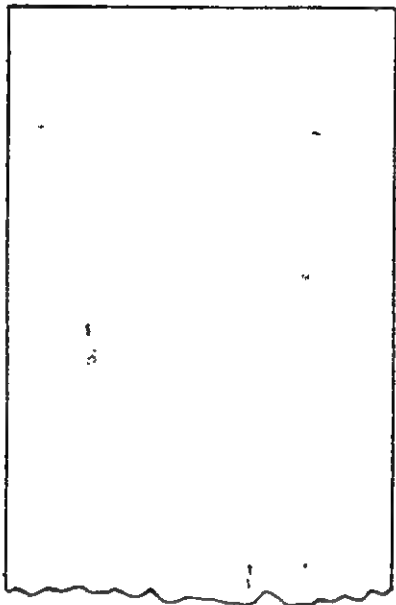
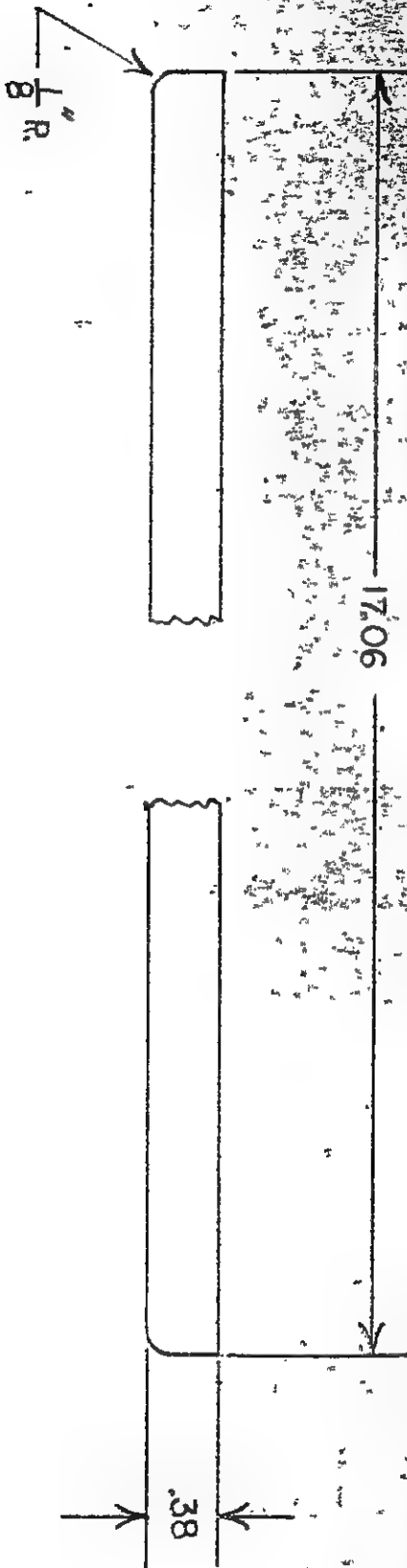


MAT'L .062 5052
 SHEAR SIZE 17.00 X 3.85
 .06 BR. K @ 90° = .110
 RADII:
 SMALL $\frac{1}{8}$ " R.
 LARGE $\frac{1}{4}$ " R.

A- SEE DETAIL A
 B- SEE DETAIL B
 C- #27 DRILL
 D- 6-32 TAP

REMOVE ALL BURRS & ROUGH EDGES
 FINISH: AL-ODINIE

REVISIONS		APPROVED BY:		DRAWN BY: <i>DMH</i>	
SYN	DESCRIPTION	DATE	DATE	REVISED	REVISION
A	REMOVE CUTOUT FOR WIRES	6/23/72		6-18-70	
STEPHENS ELECTRONICS, INC.					
CONNECTOR RAIL					
811D-103		2/16		DRAWING NUMBER: 110131A	



XX ± .015 MATL - 6061-T6

STEPHENS ELECTRONICS, INC.

SCALE: FULL

APPROVED BY:

DATE: 1/20/72

DRAWN BY *amd*
REVISED

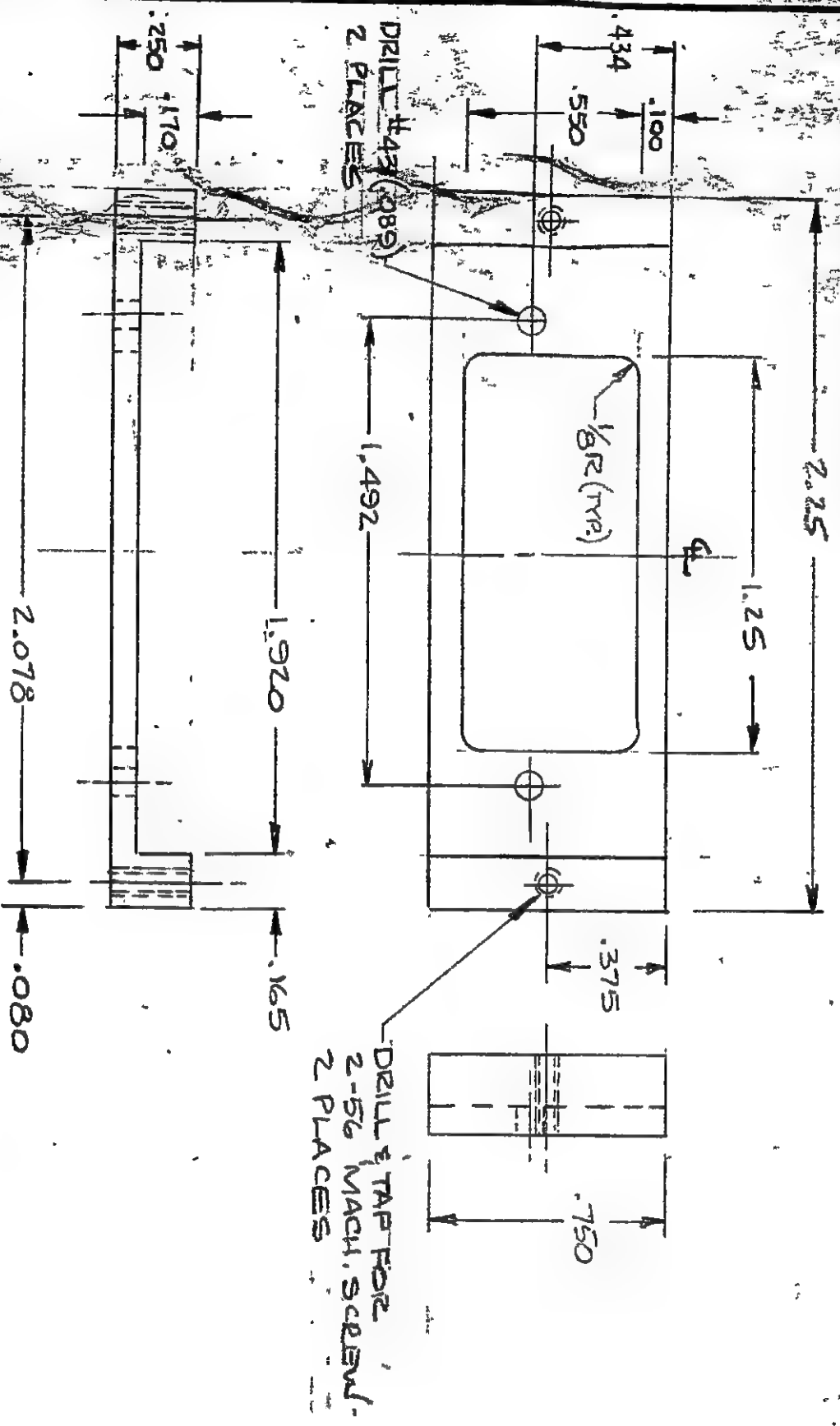
DECK SUPPORT BRACKET CROSS BAR

811D-103

8/16

DRAWING NUMBER
110132

REMOVE ALL BURRS & ROUGH EDGES
TO BE ALCOBINS



MAT'L: 6061-T6, ALUM.
 FINISH: ANODINE
 REMOVE ALL BURRS & SHARP EDGES

STEPHENS ELECTRONICS, INC.

XXX = ±.005

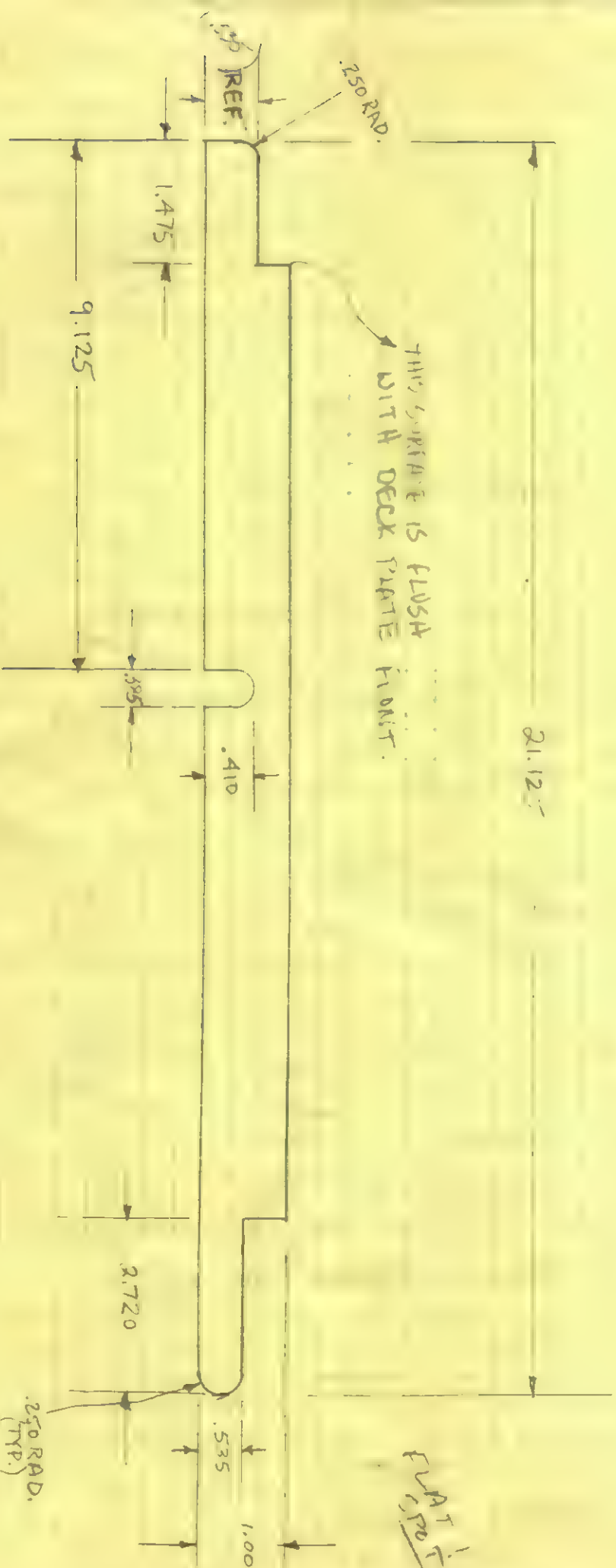
SCALE: 2:1	APPROVED BY:	DRAWN BY: G. GIER
DATE: 9/19/73		REVIEWED

BRACKET-CONNECTOR RAIL

811 D-103 4/8/16	DRAWING NUMBER: 110156
------------------	------------------------

MATC - 6061 ALUM. BAR

1" X 1"

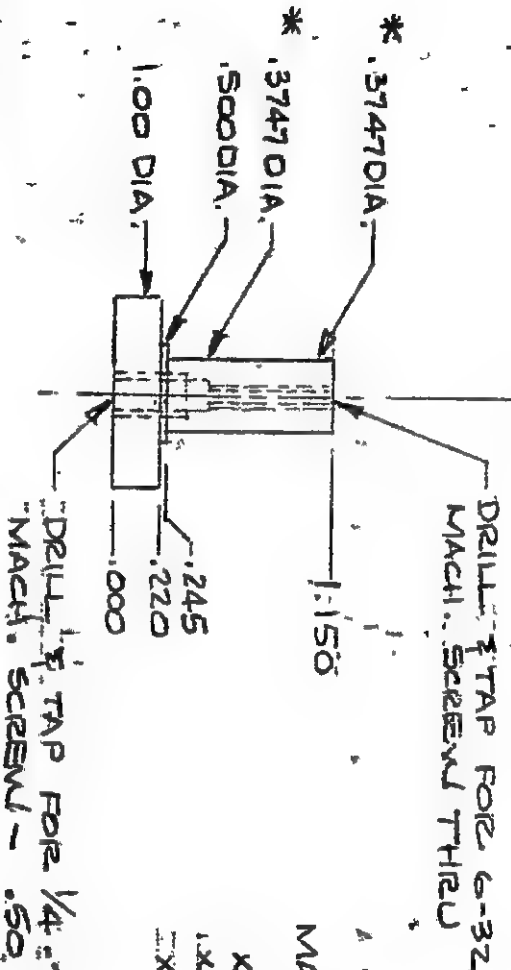


FLAT 1/2

811D / 821A - 104-40 TRK ONLY

RAIL - CABINET MOUNTING

REVISIONS		
SYM	DESCRIPTION	DATE
A	DELETED .36 DIA. UNDERCUT FROM .650 TO .615	2/2/74
B	1.130 WAS 1.115	3/24/74



* SHIP FIT TO SUPPLIED BEARING

MATERIAL: STAINLESS STEEL 303
 XXXX = ±.0005
 XXXX = ±.0005
 XXX = ±.010

STEPHENS ELECTRONICS, INC.

SCALE: FULL	APPROVED BY:	DRAWN BY: GEB/BJZ
DATE: 11/20/73		REVISED

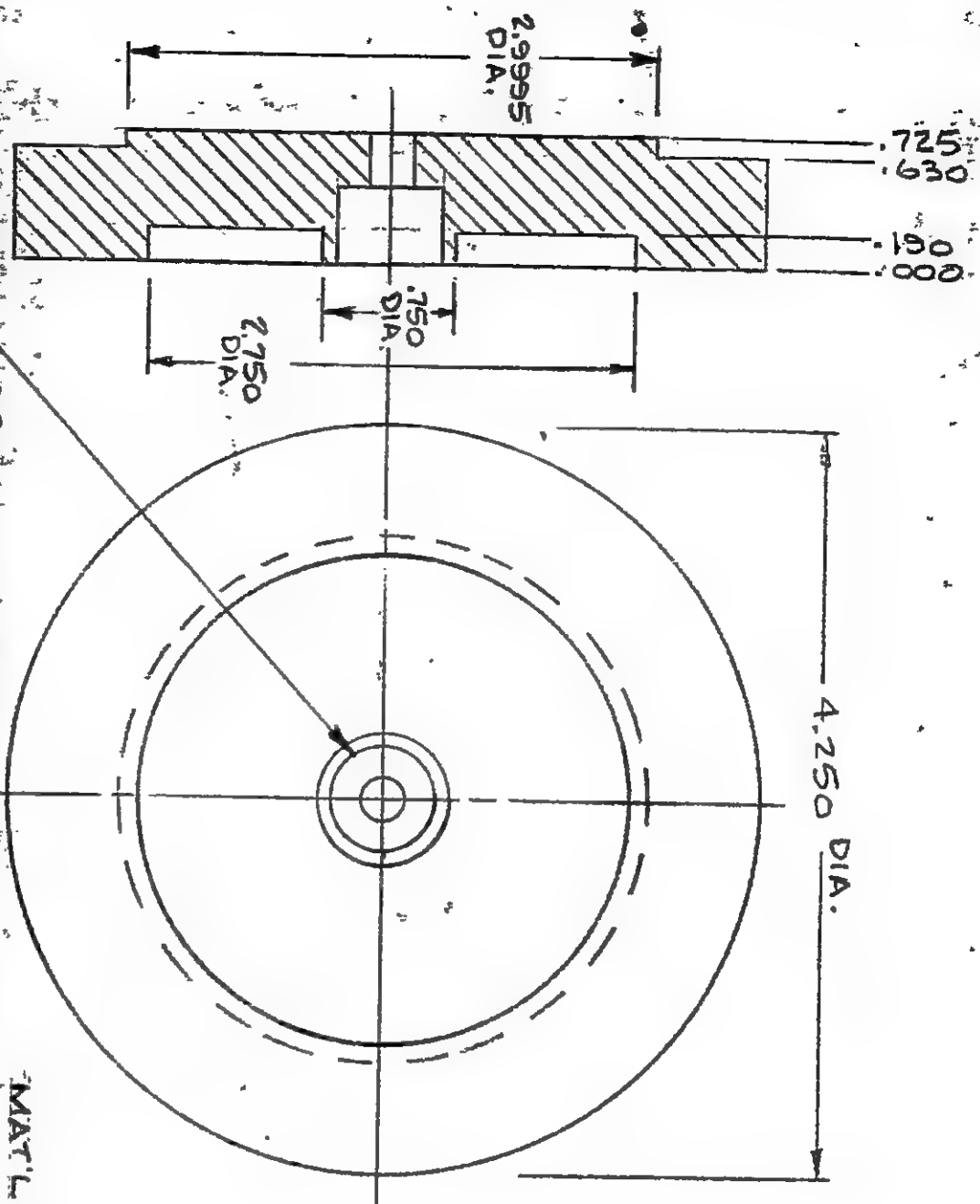
SHAFT - REVERSE IDLER SUPPORT

MODEL 811D-103 1/2 INCH

DRAWING NUMBER REV 110170 B

REVISIONS

SYM
A
CHANGED .590 TO .5905 +
+ .0005
- .000
1/15/75

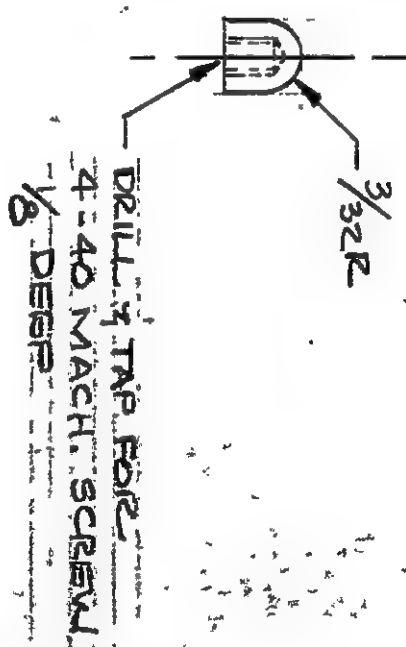
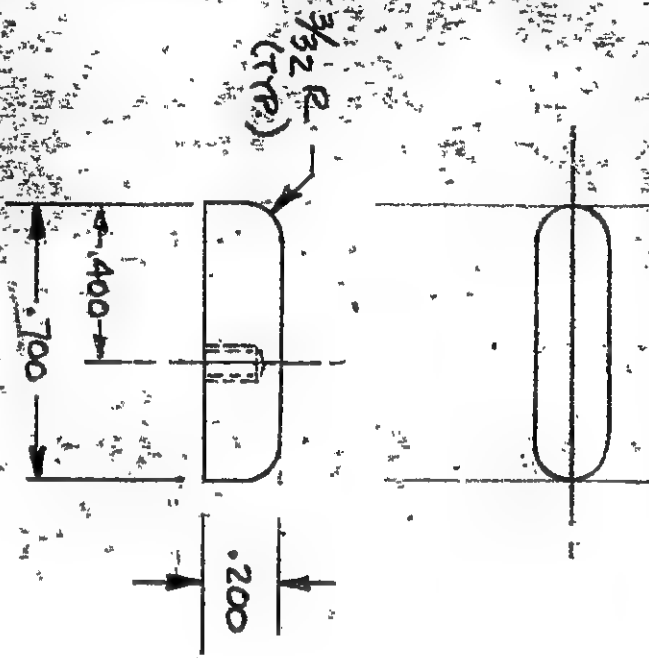


DRILL: 2.750 DIA. THRU
C BORE .590 DIA. +.0005
DEPTH .440

MAT'L: 303 STAINLESS STEEL

STEPHENS ELECTRONICS, INC.

SCALE: FULL		APPROVED BY:	
DATE: 11/20/73		DRAWN BY: G. J. [illegible]	
PART NUMBER - HUB MOUNTING - 1/2 INCH		REVISED: 1/15/75	
MODEL: 8110-103 1/2 INCH		DRAWING NUMBER: 110172H	



MATL : ST. ST.

XXX = 1.005

STEPHENS ELECTRONICS, INC.

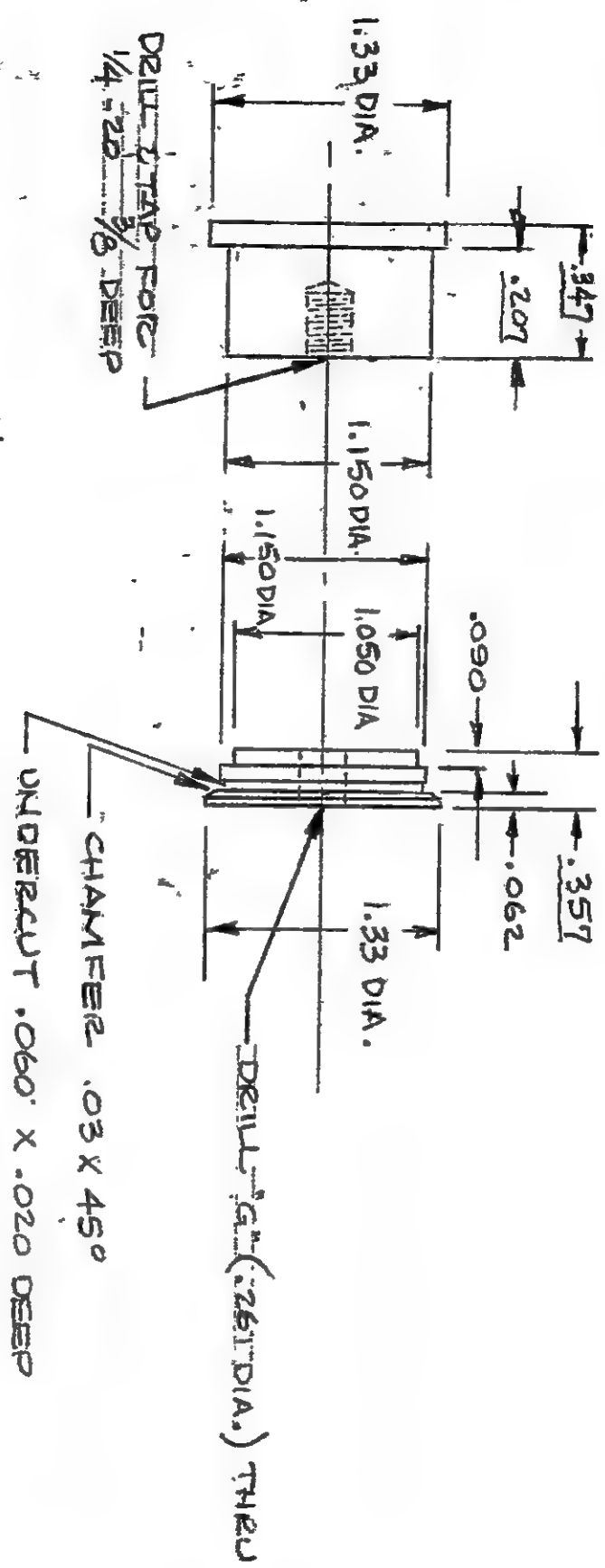
SCALE: 2:1	APPROVED BY:	DRAWN BY: GELER
DATE: 12/20/75		REVISED

REEL GUIDE - HUB $\frac{1}{2}$ TAP

811D-103

DRAWING NUMBER
110174

-1 CAP -2 POST



MATERIAL
 -1 1/2-2 MAKE FROM 1.375 DIA. 303 S.S.
 -3 TUBING 1.250 O.D. .035 WALL 304 S.S.

XX = ±.005 XXX = ±.001

STEPHENS ELECTRONICS, INC.

SCALE: NONE	APPROVED BY:	DRAWN BY: GELER
DATE: 2/15/74		REVISED

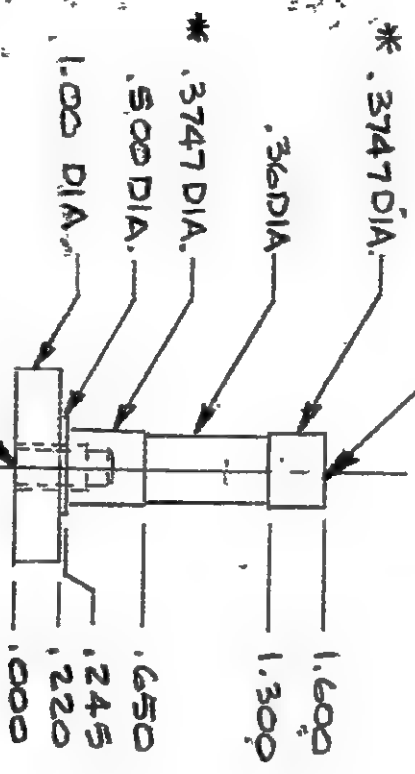
COMPENSATING GUIDE ASSY - 1/2" TAP

811 D-103

DRAWING NUMBER
 REV. 110179

DRILL & TAP FOR 6-32
MACH. SCREW - .50 DEEP

DRILL & TAP FOR 1/4-20
MACH. SCREW - .50 DEEP



MATERIAL: 303 STAINLESS

TOL: .XX = $\pm .010$, .XXX = $\pm .005$

* INDICATES TOL. $\pm .0001$
- .0002

STEPHENS ELECTRONICS, INC.

SCALE: FULL

APPROVED BY:

DATE: 11/17/80

REVIEWED

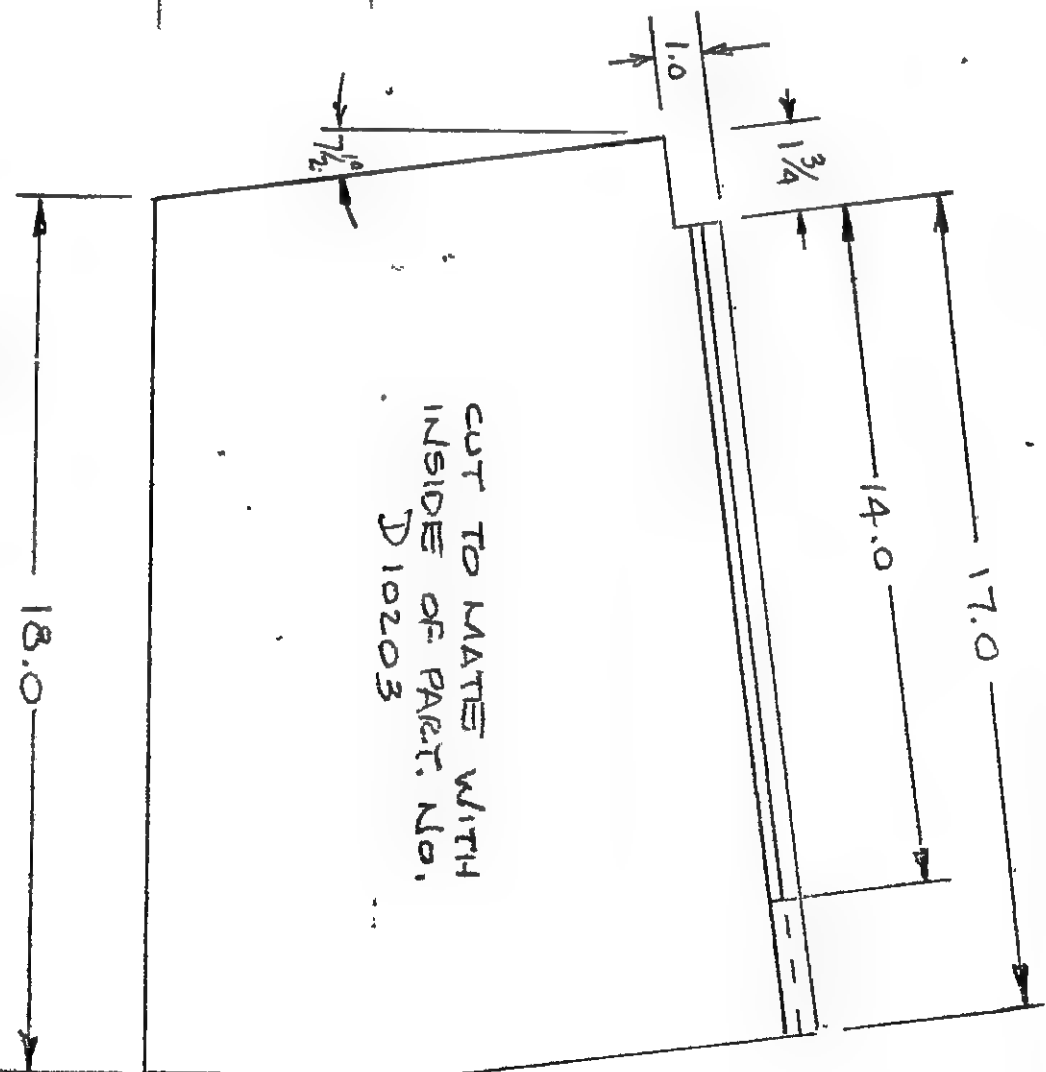
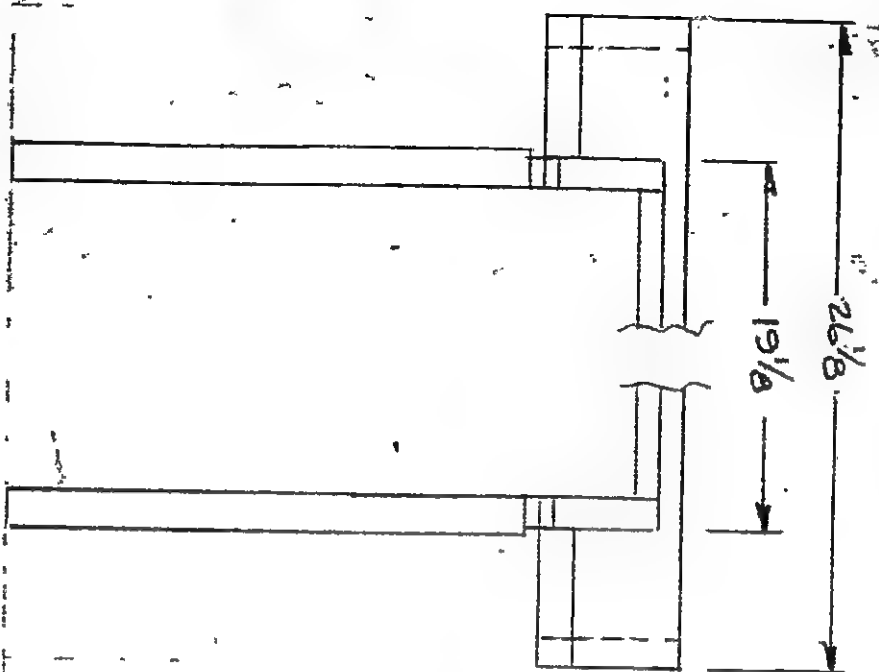
DRAWN BY G15152

SHAFT - REVERSE IDLER SUPPORT - 1 INCH

811D-103

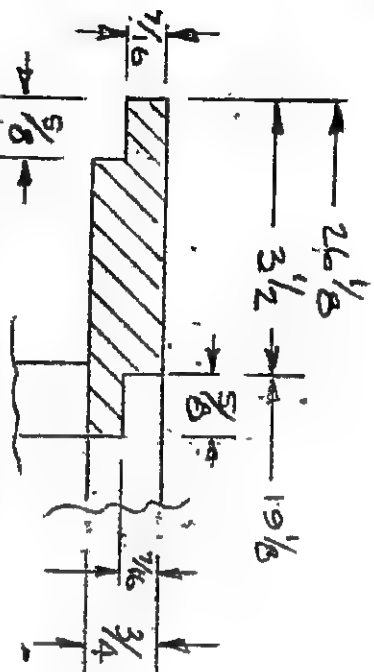
DRAWING NUMBER

110201



CUT TO MATCH WITH
INSIDE OF PART. NO.
D10203

3/4 PLYWOOD TOP.



L.H. FILTER SECTION SHOWN
R.H. OPPOSITE

STEPHENS ELECTRONICS, INC.

SCALE: 1/4" = 1/2"

APPROVED BY:

DATE: 11/6/73

DRAWN BY G. GIER

REVISED

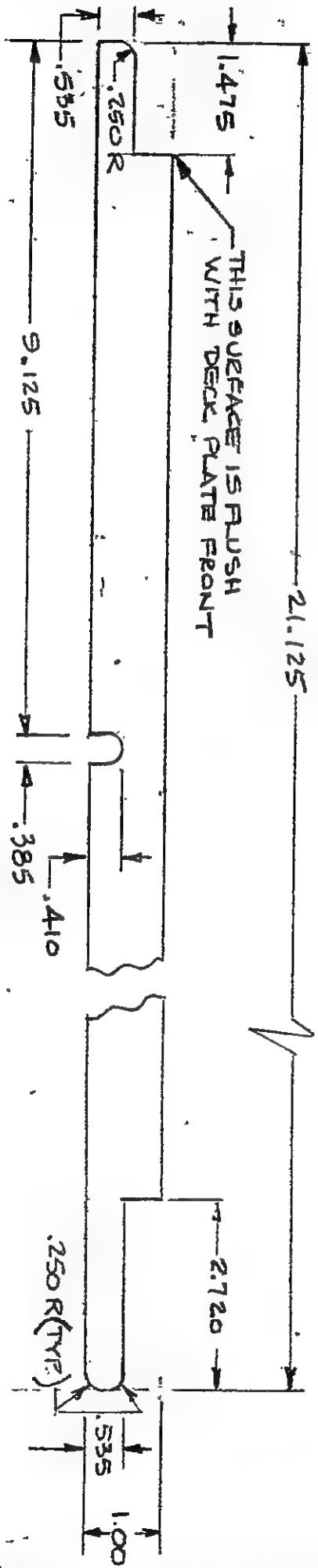
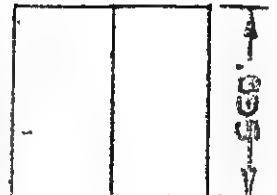
ADAPTER - 14" TO 10 1/2" REEL DECK PLATE

MODEL 811D - 104/103

DRAWING NUMBER

REV. 110204

END VIEW
ACTUAL SIZE



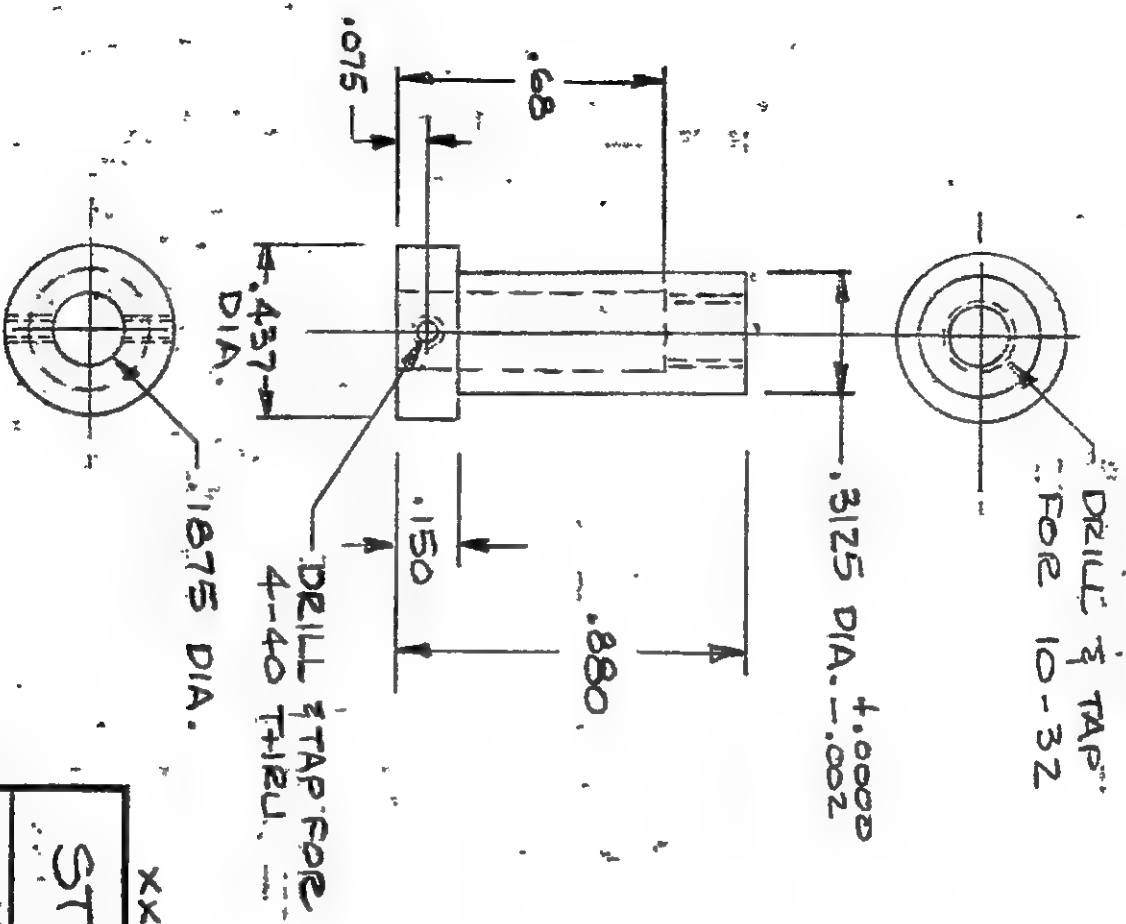
THIS SURFACE IS FLUSH
WITH DECK PLATE FRONT

MAT'L: 1X1 ALUM BAR 6061

STEPHENS ELECTRONICS, INC.

SCALE: 1/2		APPROVED BY:	
DATE: 9/18/77		DRAWN BY: GED	
RAIL - CABINET MOUNTING		REVISED	
MODEL 811D/821A-104 40TRK ONLY		DRAWING NUMBER: 110214	
		REV	

REVISIONS		
SYM	DESCRIPTION	DATE
A	ADDED BEARING TO L.	6/21/72



MATERIAL: ALUM. 6061-T6
FINISH: ALUMINUM

XXX = ±.005

STEPHENS ELECTRONICS, INC.

SCALE: 2:1

DATE: 1/20/72

APPROVED BY:

DRAWN BY: G. E. GIER

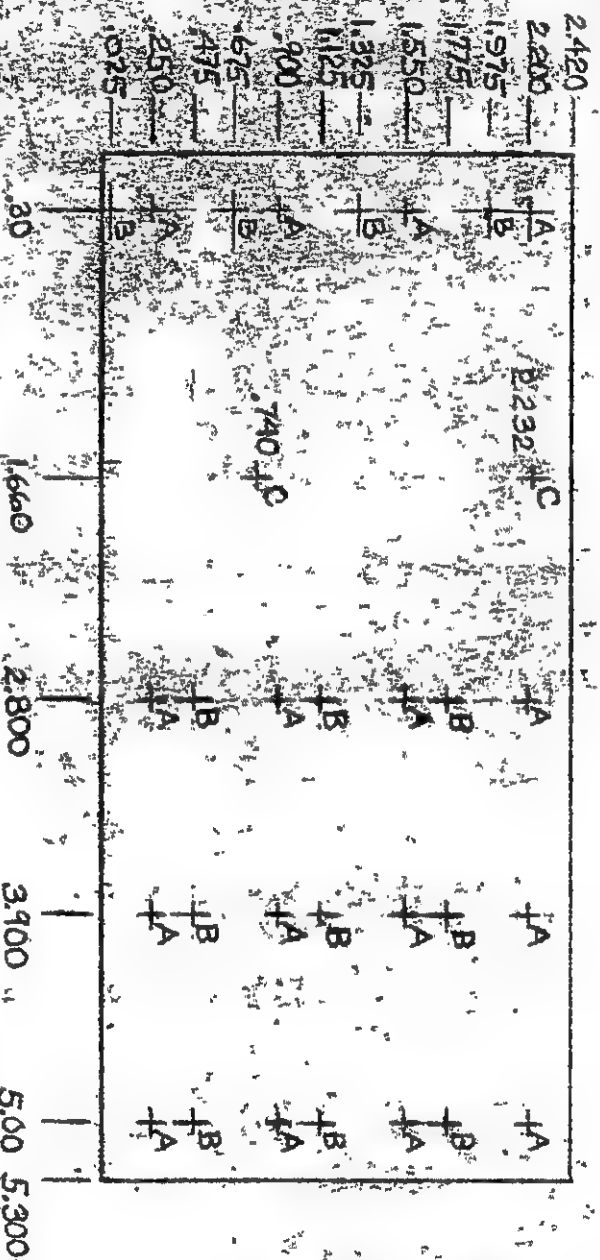
REVIEWED

SHAFT-TAPE LIFTER
SUPPORT BRACKET

811D-103

DRAWING NUMBER: 110128A

SYM	DESCRIPTION	DATE
B	CORRECTION - 2" HOLES ON 30 & WEBS - 475	10/14
	1.135 & 1.175	



MAT'L - .025 THK. 6061-T6 XXX ± .005

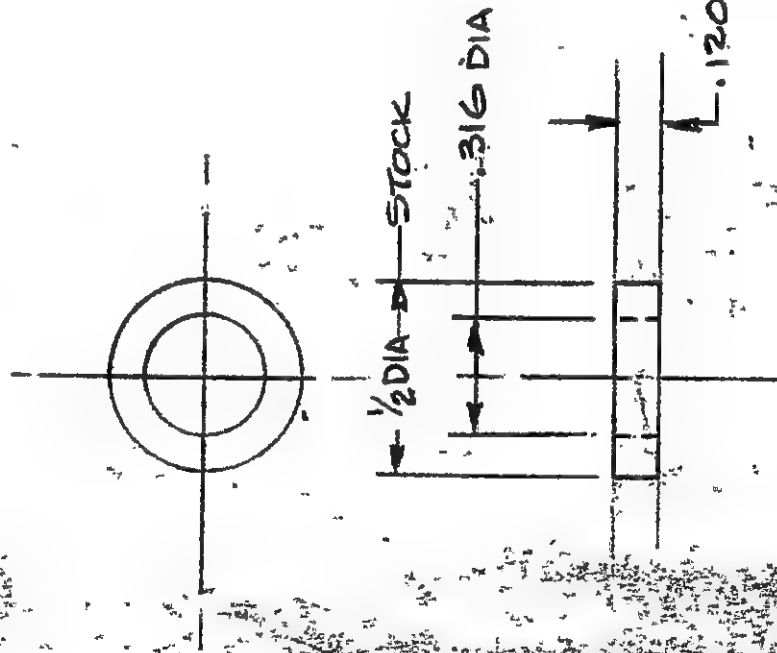
STEPHENS ELECTRONICS, INC.

SCALE: FULL	APPROVED BY:	DRAWN BY: SRS
DATE: 3-20-73		REVISIO

BACK PLATE FOR BUD-4300 CHASSIS

DRAWING NUMBER
110946 B

- A 2.50 DIA
- B .125 DIA
- C .375 SQUARE



MAT'L: ALUM 6061-T6
FINISH: ALODINE

XX X = ±.005

STEPHENS ELECTRONICS, INC.

SCALE: 2:1 APPROVED BY:

DRAWN BY: GEIER

DATE: 4/26/72

REVISED

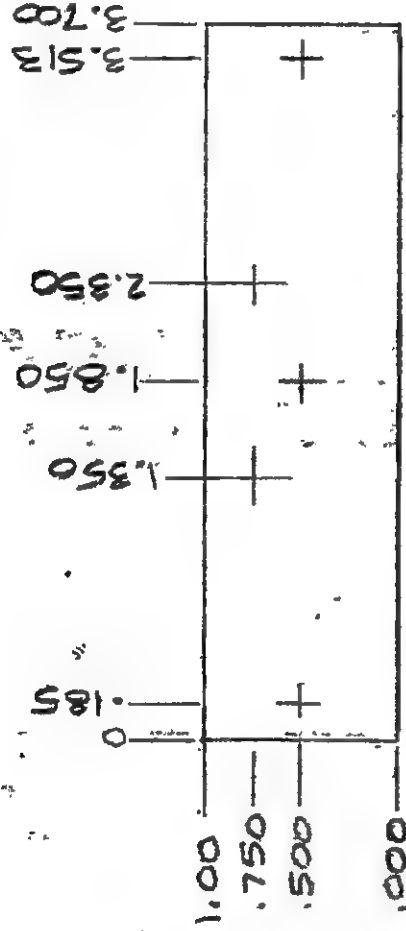
SPACER - TAPE LIFTER SHAFT

811 D-103

DRAWING NUMBER
110146

2 REQ'D / DECK

REVISIONS		
SIGN	DESCRIPTION	DATE
A	1.850 WAS 1.849 ADDED 4-40 HOLES	12/7/72



DRILL 4 TAP FOR
4-40 - 2 PLACES



COUNTER BORE
.875 DIA
.25 DEEP
MATCH TO BEARING

DRILL #30 \pm .0025 DIA X .875
C/SINK FOR 4-40 SCREW
2 PLACES

FINISH: ALODINE

MAT'L - ALUM 6061-T6

STEPHENS ELECTRONICS, INC.

APPROVED BY:

DRAWN BY SRS

REVISED

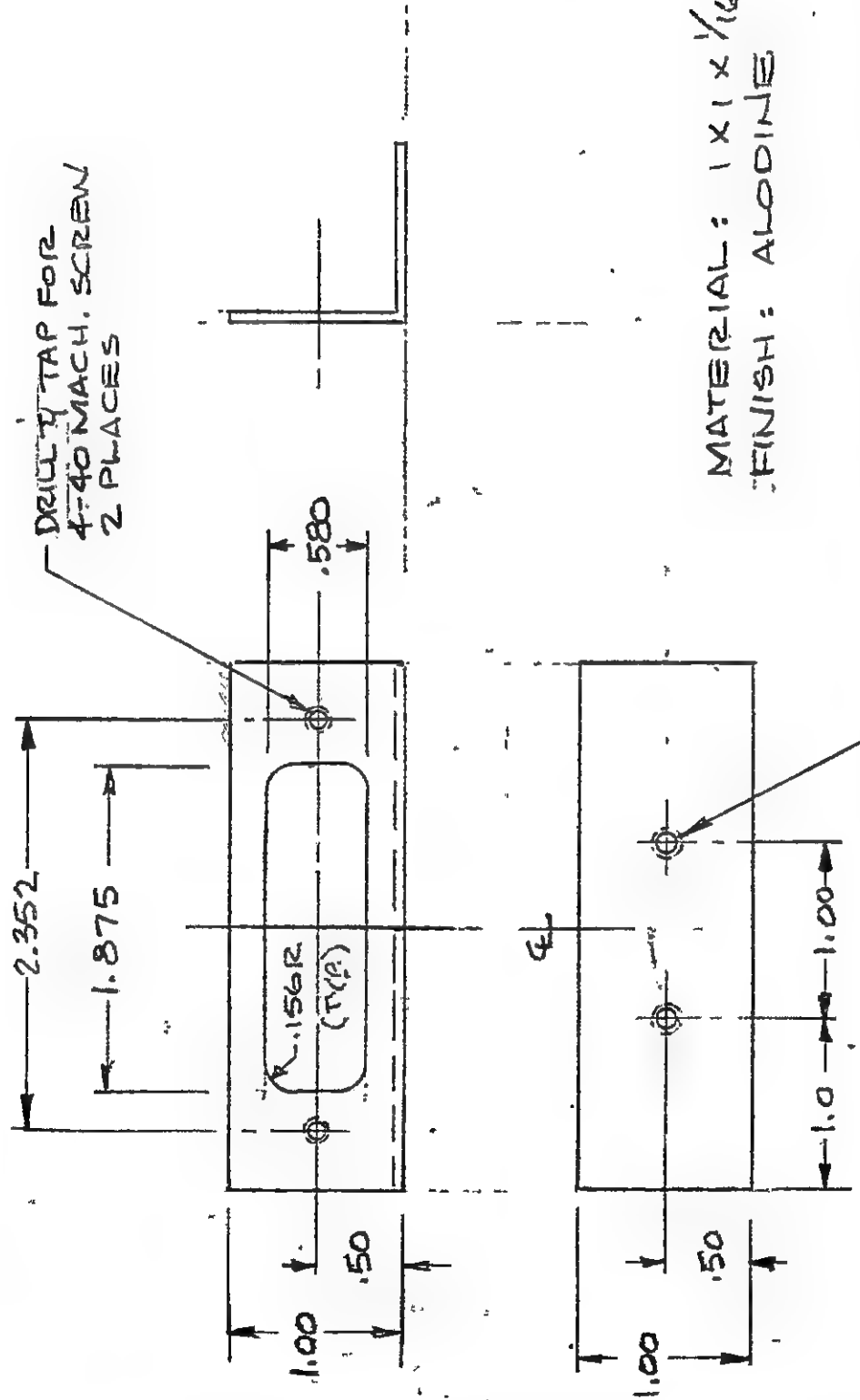
SCALE: FULL

DATE: 3-10-73

BEARING SUPPORT PLATE - REEL MOTOR

DRAWING NUMBER REV.

110160 A



MATERIAL: 1X1 X 1/16 ALUM. EXTRUSION
FINISH: ALODINE

STEPHENS ELECTRONICS, INC.

SCALE: FULL	APPROVED BY:	DRAWN BY: G. E. R.
DATE: 10/16/73		REVISED

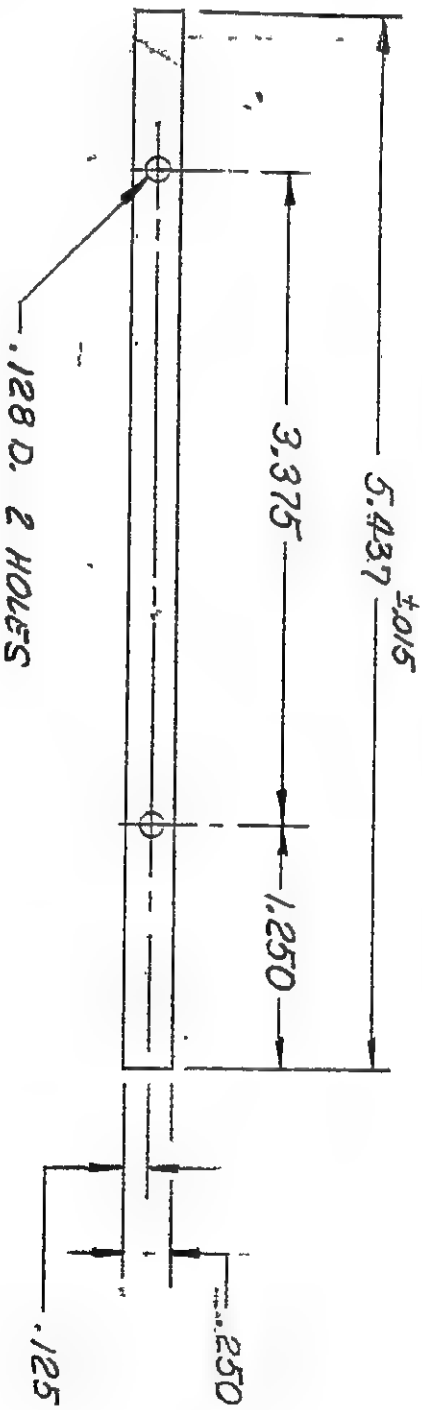
BRACKET - CONNECTOR MOUNTING

MODEL 811 D-103

DRAWING NUMBER
110166
REV

1/DEK

REVISIONS
 A1 REMOVED 30° CUT
 5.437 WAS 5.312



NOTES

1. MATL. 1002 THK. 5052-H34
2. FINISH. ALUMINE #200 OR 1EIDITE
3. BREAK ALL SHARP EDGES

2. EQUIPMENT

XX = $\pm .02$
 .XX = $\pm .010$

TAPE GUIDE

STEPHEUS ELECTRONICS
 BUEBAUK, CALIF 842-5116

DESIGN: A. Dimoff 1-15-65
 SCALE: FULL SCALE

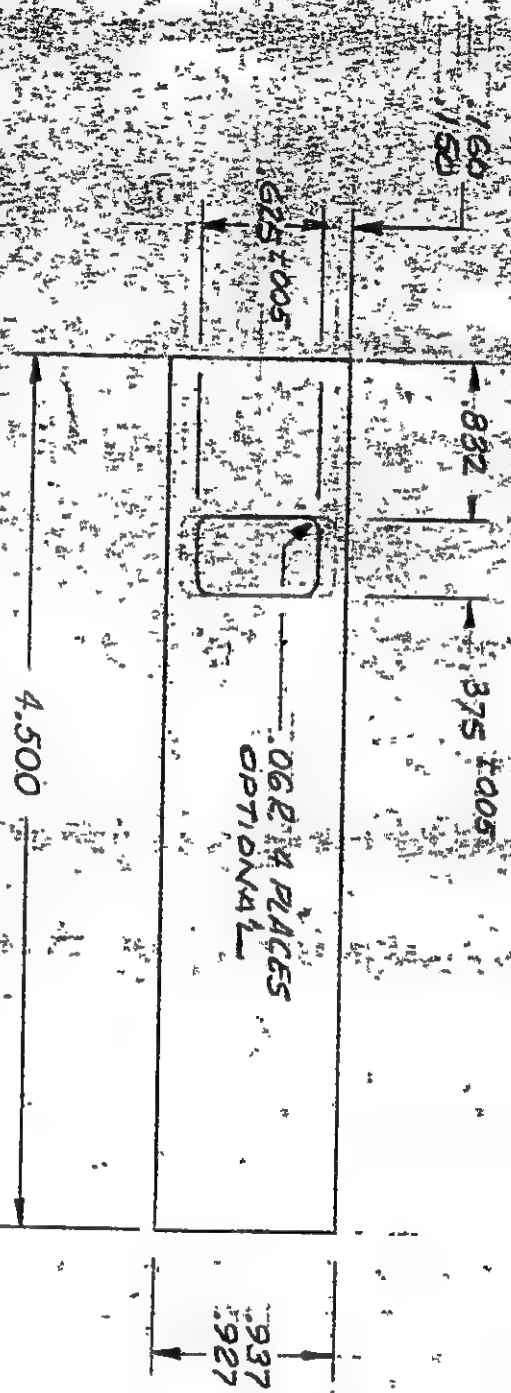
1300029

A

REVISIONS

A. DIMENSIONS & DRAWING

.832 WAS .820 .375 WAS .400
 .625 WAS .600 .160 WAS .068
 .063



MATL. .032 THK 2024-T3 OR 6061-T6 AL
 FINISH: PEEBASS & PAINT FLAT BLACK

MASK PLATE

1 REQ/UNIT

STEPHEN ELECTRONICS

BUEBAK, CALIF. 842-5116

DESIGN: M. Munnell 1/16/65

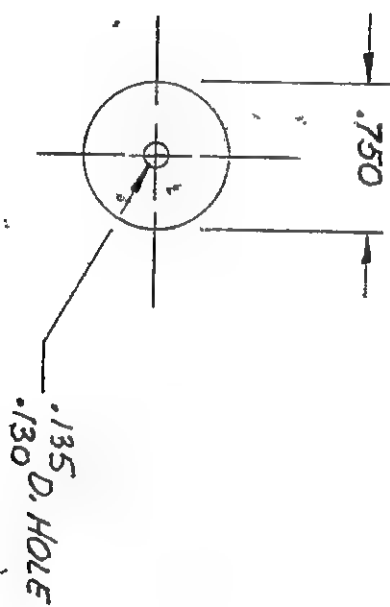
FULL SCALE

130030

REV

A

REVISIONS
A HOLE SIZE WAS .114
3/8" DIA



MATERIAL: .018 THK TEFLON SHEET

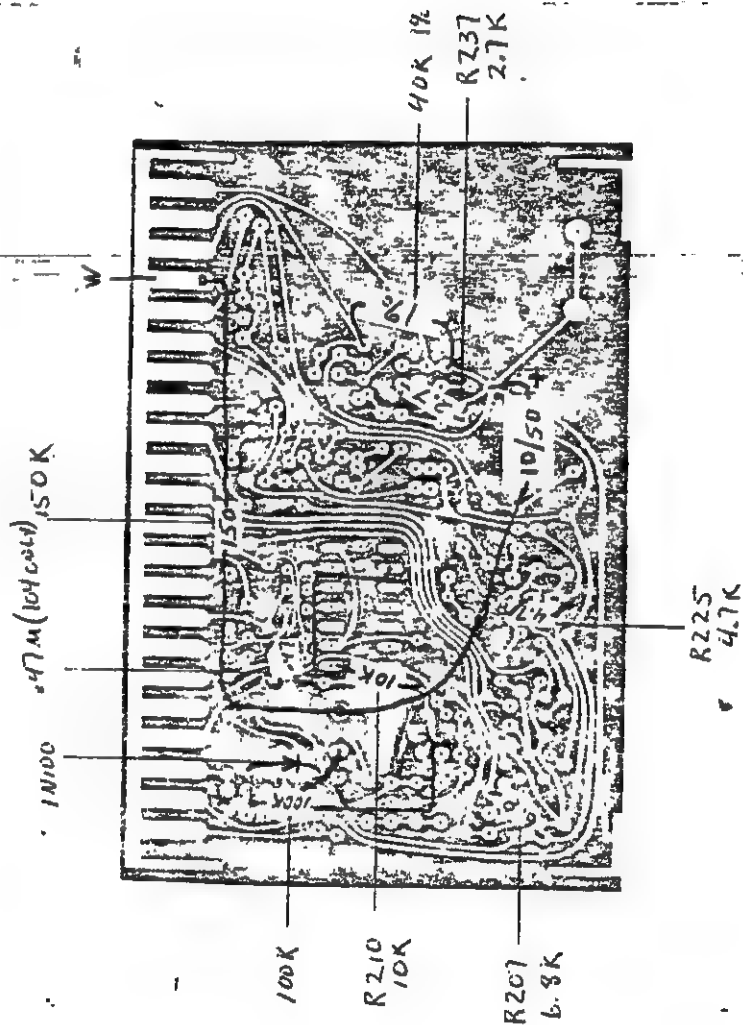
SLIDING WASHER
STEPHENS ELECTRONICS
BUEBAUL, CALIF. 842-5116
FULL SCALE

130031 A
REV

5/17/76

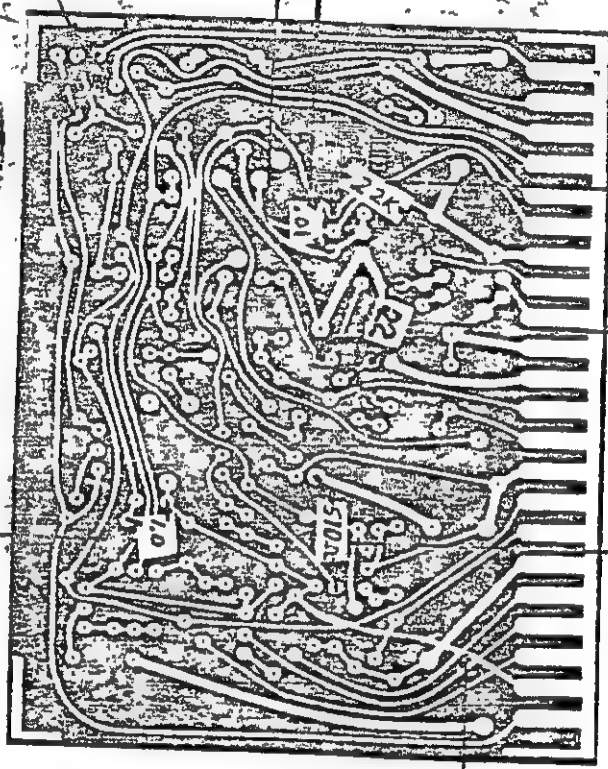
103-104

#310164



103- NO 47M CAP.

104- ADD 47M CAP.



R119
22K

22K

R138
510A

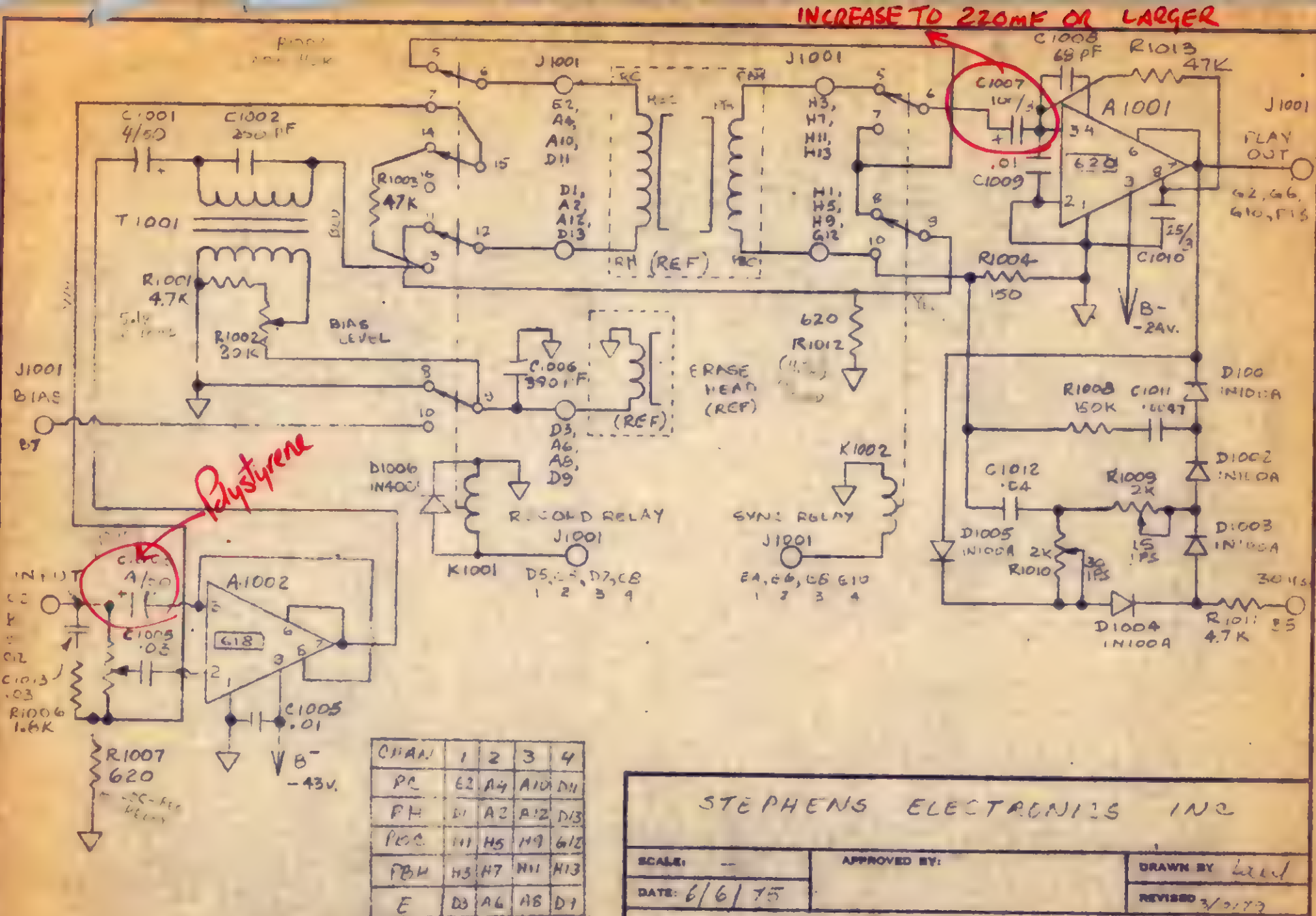
JUMPER

ON 10-1
ADD 1W10P

C112

811D-103

214/120



STEPHENS ELECTRONICS INC

SCALE: —

APPROVED BY:

DRAWN BY *LWD*

DATE: *6/6/75*

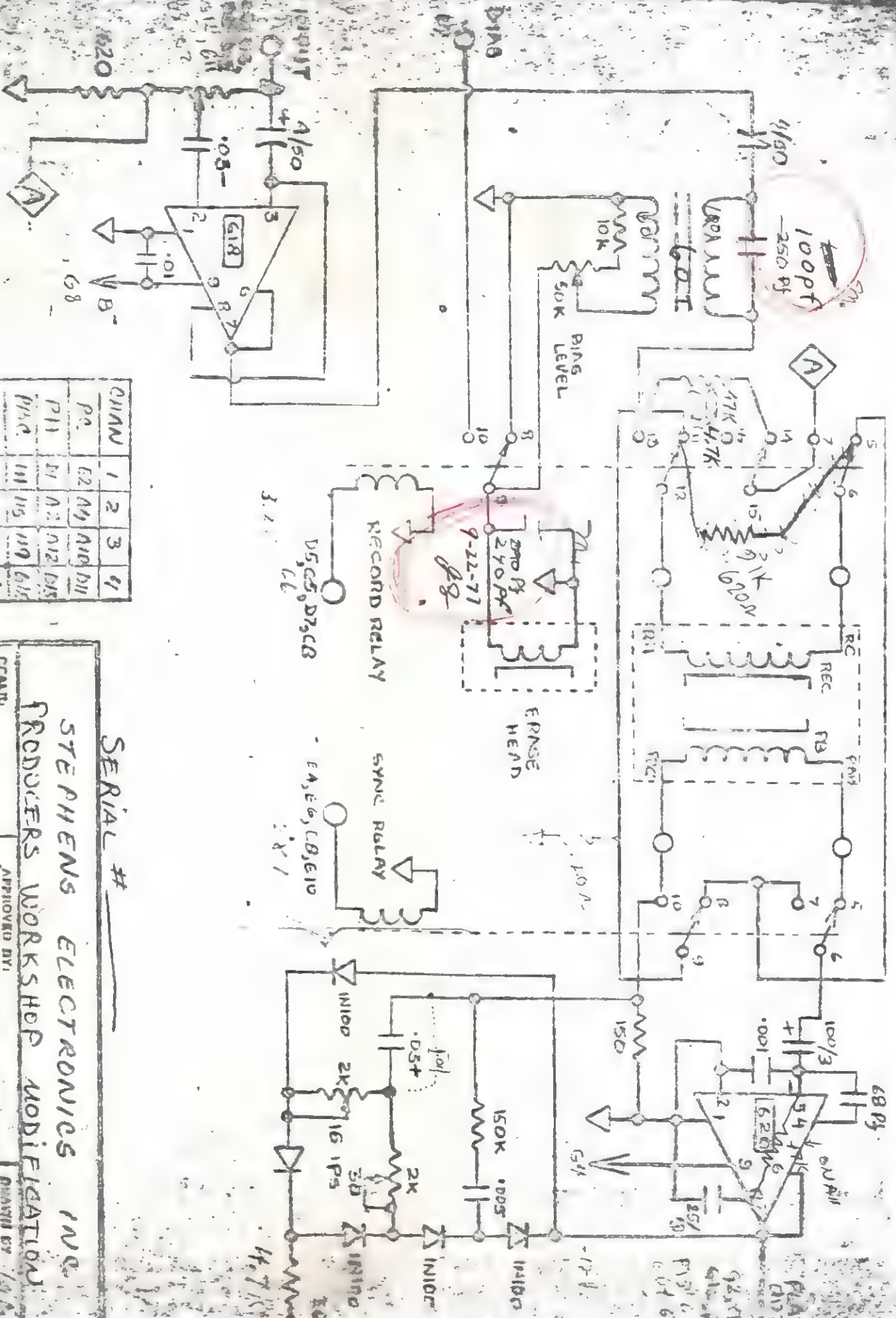
REVISED *3/2/79*

PRE AMP ELECTRONICS

811-D 3100

DRAWING NUMBER

110912-C



SERIAL #

STEPHENS ELECTRONICS INC.

PRODUCERS WORKSHOP MODIFICATION

CCABR

APPROVED BY:

HIGH BIAS FREQ

DATE 6/6/75

250 KHz

DESIGNED BY

APPROVED

PRE AMP ELECTRONICS 9/20

811-D 3/100

DRAWING NO.

A10, E10, G10, G12
TO EFL SYNC SWITCH FOR OUT RUN SELECT
B5, D7, E8, H7

PLAY INPUT
A6, G6, E6, H5

CM 100/25V
5K
R.B. LEVEL

TO REC AMP
A2, G2, D3, G2

REC INPUT
B1, D1, H1, E2

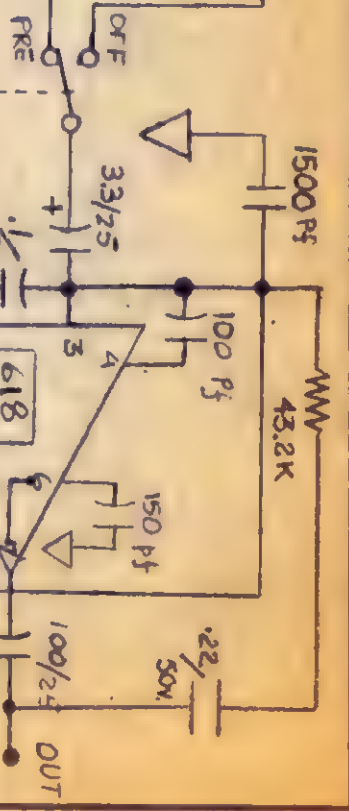
CM 25K
REC LEVEL

10K CM
DISTORTION TRIM
IN4001

30 IPS CONTROL IN
G12

30 IPS
8.2K
4.7K
1005

5K
CCW
PLAY L.F. EQ



- NOTES
1. BOTH RELAYS ARE ENERGISED
 2. RELAYS ARE COMMON TO ALL CHANNELS
 3. PIN NUMBERS ARE FOR GREEN AMPHERUL CONNECTORS
 4. ALL RESISTOR VALUES ARE 1/4 WATT

STEPHENS ELECTRONICS INC

SCALE:
DATE: 5-30-75
APPROVED BY: *W. Geier*
DRAWN BY: *W. Geier*

4300 LINE AMPLIFIER CARD

FOR 811-D ELECTROPHONES

DRAWING NUMBER
110932.

AVC, E1, E1C, G10
TO SET SYNC SWITCH FOR OUT PGM SELECT
65, D7, E8, H7

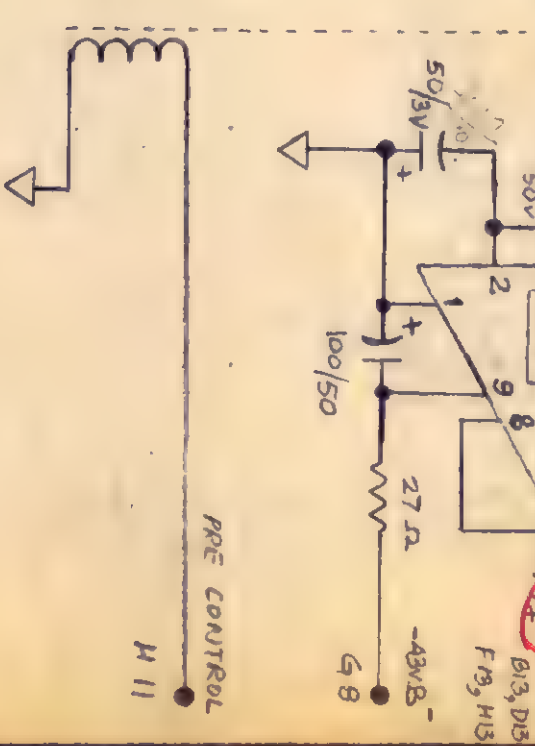
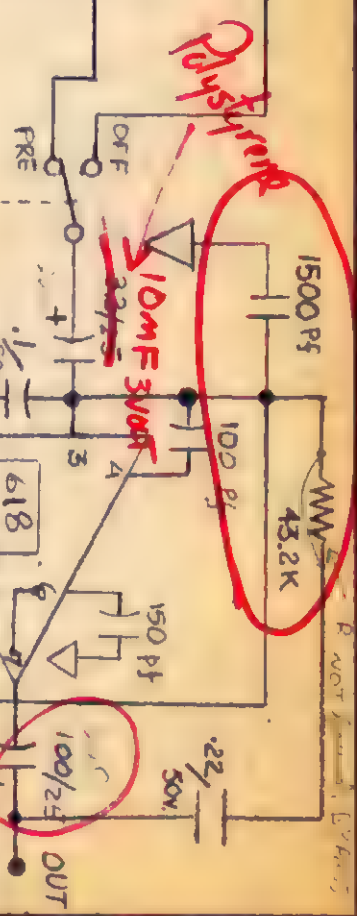
PLAY INPUT
A6, G6, E6, H5
R.B. LEVEL
100/25V
220

TO REC AMP
A2, C2, D3, G2

REC INPUT
B1, D1, H1, E2
REC LEVEL
25K
10K CW
DISTORTION TRIM
IN4001
IN4001

30 IPS CONTROL IN
G12
30 IPS
8.2K
4.7K
1.005
1.0/50
PLAY L.F. EQ
5K
CCW

- NOTES:
- 1 BOTH RELAYS ARE ENERGISED
 - 2 RELAYS ARE COMMON TO ALL CHANNELS
 - 3 PIN NUMBERS ARE FOR GREEN AMPHERNOL CONNECTORS
 - 4 ALL RESISTOR VALUES ARE 1/4 WATT



STEPHENS ELECTRONICS INC.

SCALE:	APPROVED BY:	DRAWN BY:
DATE: 5-30-75		REVISED 8-28-80

4300 LINE AMPLIFIER CARD

FOR 811-D ELECTRONICS

DRAWING NUMBER
110932-B

A10, A10, G10, G10
 SET SYNC SWITCH FOR OUT PGM SELECT

B5, D7, G8, H7

PLAY INPUT

A4, G6, E6, H5

REC AMP

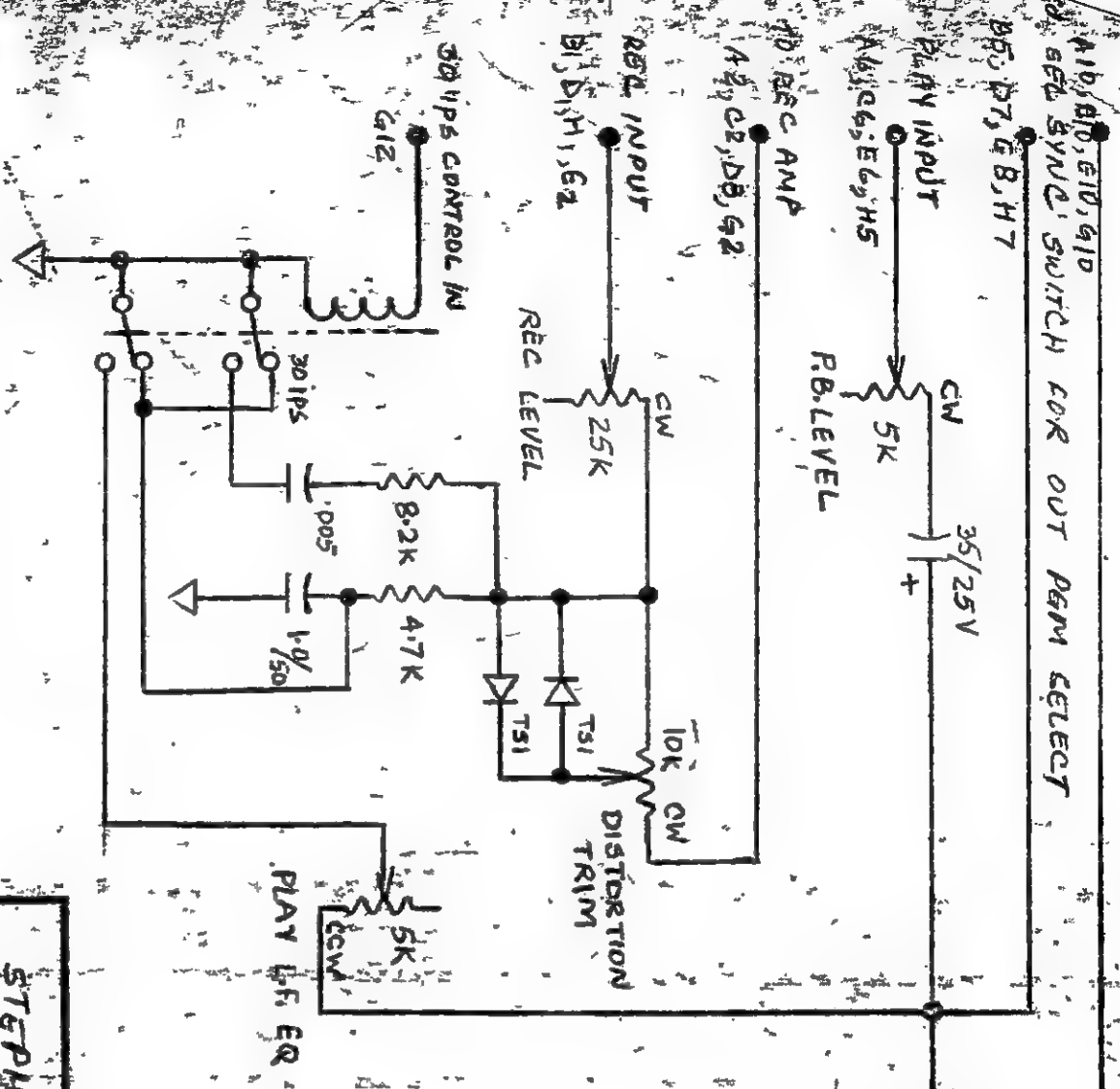
A2, G2, D8, G2

REC INPUT

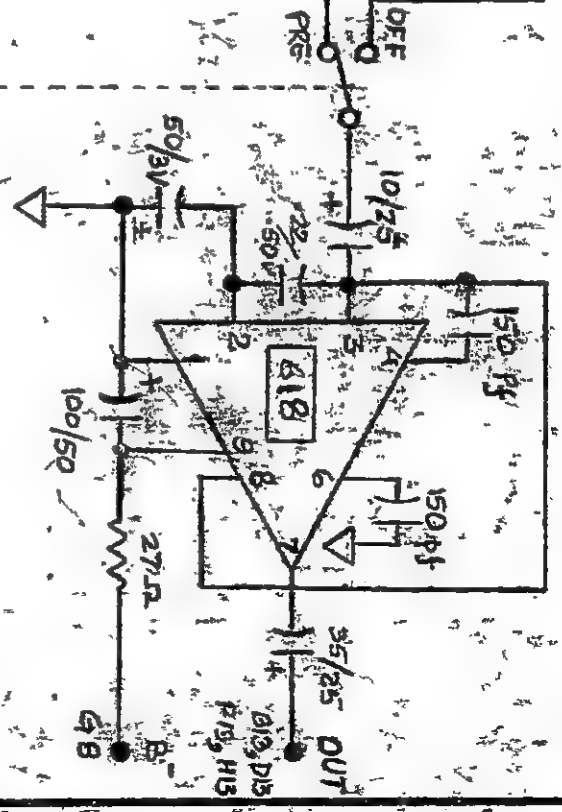
B1, D1, H1, G2

30 UPS CONTROL IN

G12



- NOTES
1. BOTH RELAYS ARE ENERGISED
 2. RELAYS ARE COMMON TO ALL CHANNELS
 3. PIN NUMBERS ARE FOR GREEN CHANNEL CONNECTORS
 4. ALL RESISTOR VALUES ARE 1/4 WATT



STEPHENS ELECTRONICS INC

SCALE: 1"

PAGE: 9-30-75

APPROVED BY:

DRAWN BY: L.A.T.

REVISED:

4300 LINE AMPLIFIER CARD

FOR 811-D ELECTRONICS

DRAWING NUMBER

110932-A

A10, E10, E10, G12
TO SEL SWNC SWITCH FOR OUT PLM SELECT

B5, D7, E8, H7

PLAY INPUT

A6, Q6, E6, H5

P.B. LEVEL

TO REC AMP

A2, C2, D3, G2

REC INPUT

B1, D1, H1, E2

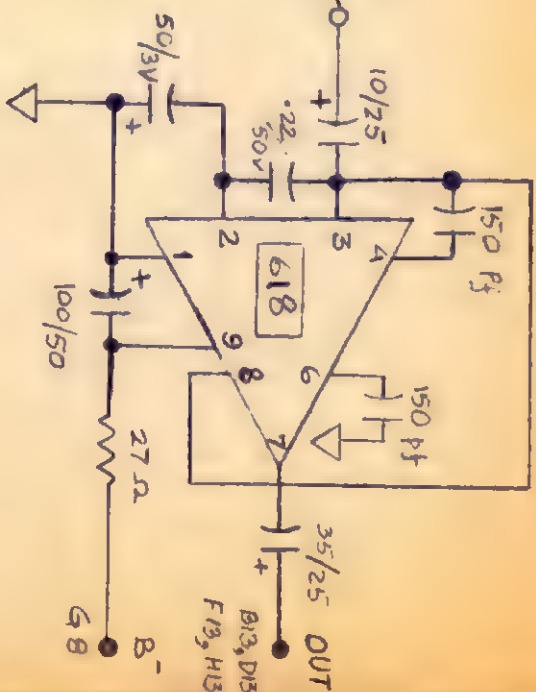
REC LEVEL

30 IPS CONTROL IN

G12

PLAY L.F. EQ

OFF PRE



PRE CONTROL

H11

STEPHENS ELECTRONICS INC.

SCALE:

DATE: 5-30-75

APPROVED BY:

DRAWN BY LALP

REVISED

4300 LINE AMPLIFIER CARD

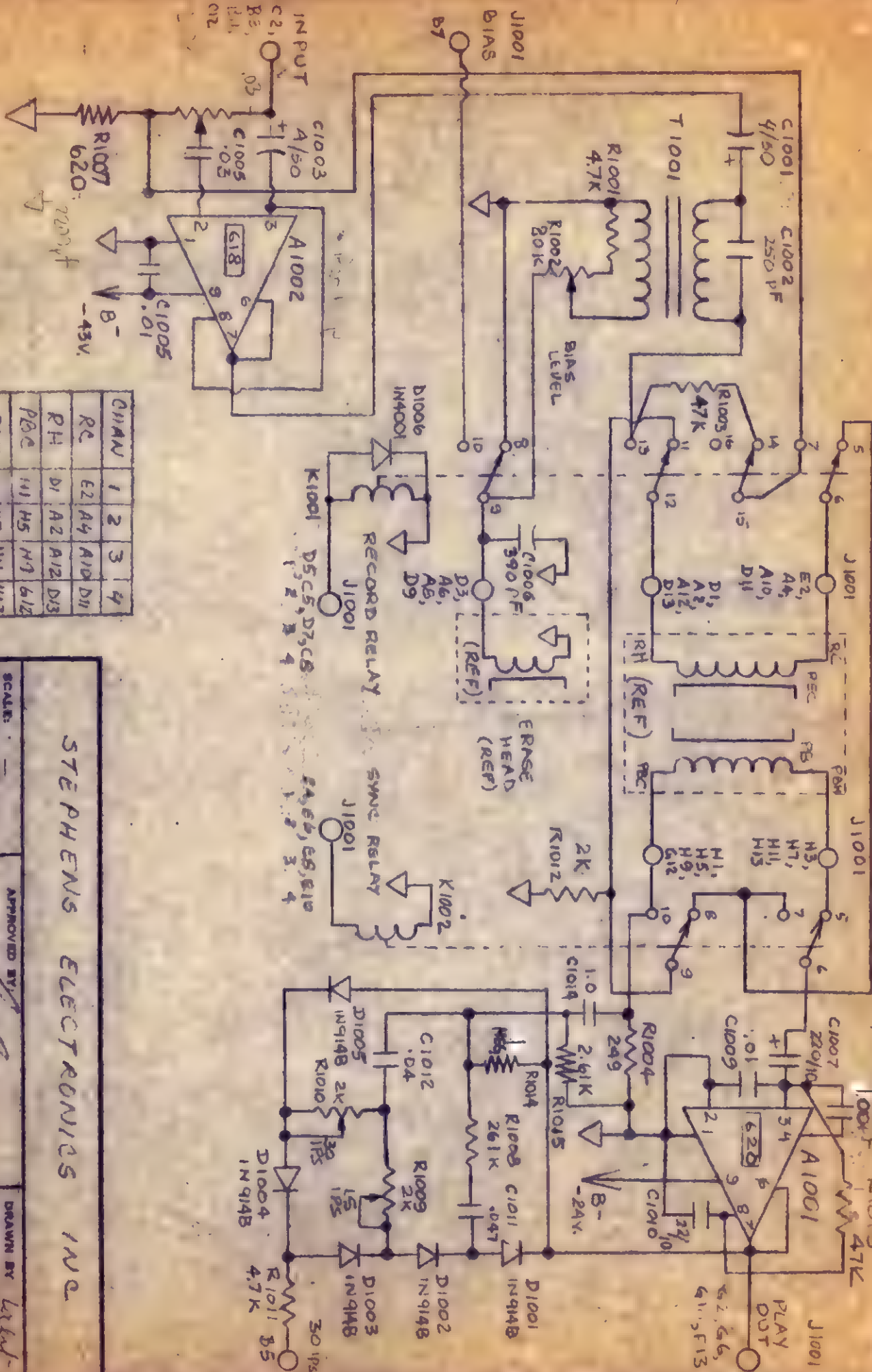
FOR 811-D ELECTRONICS

DRAWING NUMBER

110932-A

NOTES

- 1 BOTH RELAYS ARE ENGAGED
- 2 RELAYS ARE COMMON TO ALL CHANNELS
- 3 PIN NUMBERS ARE FOR GREEN AMPHENOL CONNECTORS
- 4 ALL RESISTOR VALUES ARE 1/4 WATT



CHAN	1	2	3	4
RE	E2	A4	A10	D11
RH	D1	A2	A12	D3
REC	H1	H5	H7	H13
PHM	H3	H7	H11	H13
E	D3	A6	A8	D1

ALL RESISTORS 1/4 WATT
ALL CAPACITORS 50 VOLT AND
IN ALL CAPACITORS UNLESS OTHERWISE
NOTED

AMPLIFIER CROWN
PIN NUMBERS
CARRYING SIGNAL
TO HEAD STACK

STEPHENS ELECTRONICS INC.

SCALE: -

APPROVED BY

DATE: 6/6/75

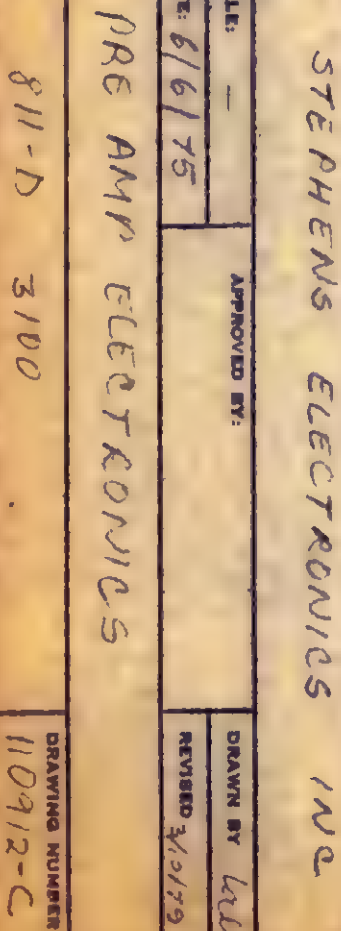
Lee

DRAWN BY

REVISED 8/28/80

PRE AMP ELECTRONICS

811-D 3100



AMPLIFIER CMM.
 VIN MODIFIED
 CALLYNO'S SIGNAL
 TO NEMO STACK

CHAS	1	2	3	4
R2	E2	A4	A10	N1
PH	D1	A2	A12	D3
PE2	H1	H5	H9	H12
WRL	H3	H7	H11	H13
E	D3	A6	H8	D9

NOTE 1: 620 RESISTOR REMOVED FOR SYNC P.B MATCH

STEPHENS ELECTRONICS INC 1-84 SAG

SCALE: — APPROVED BY: —

DATE: 6/6/75

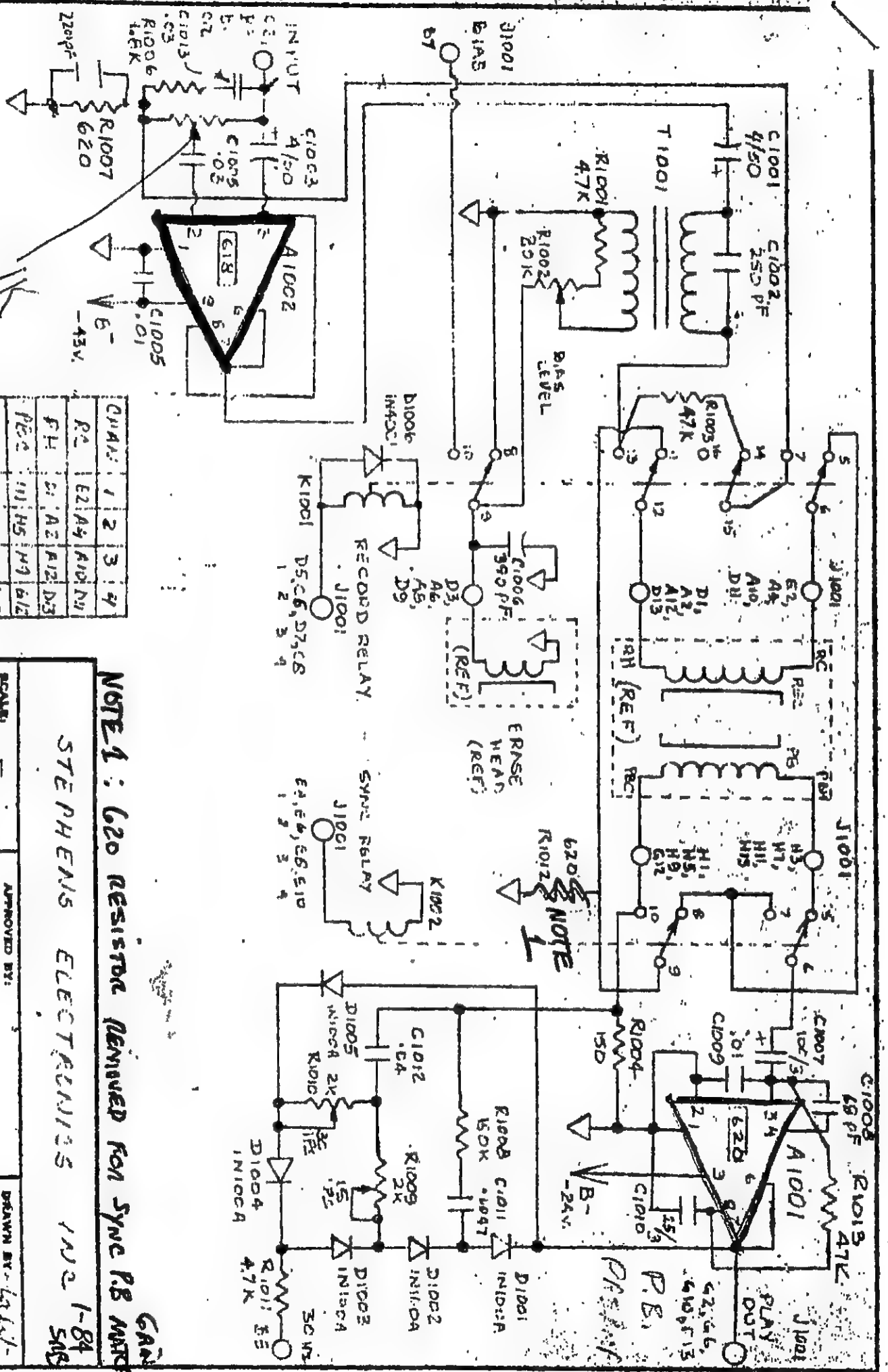
DRAWN BY: LALLI- —

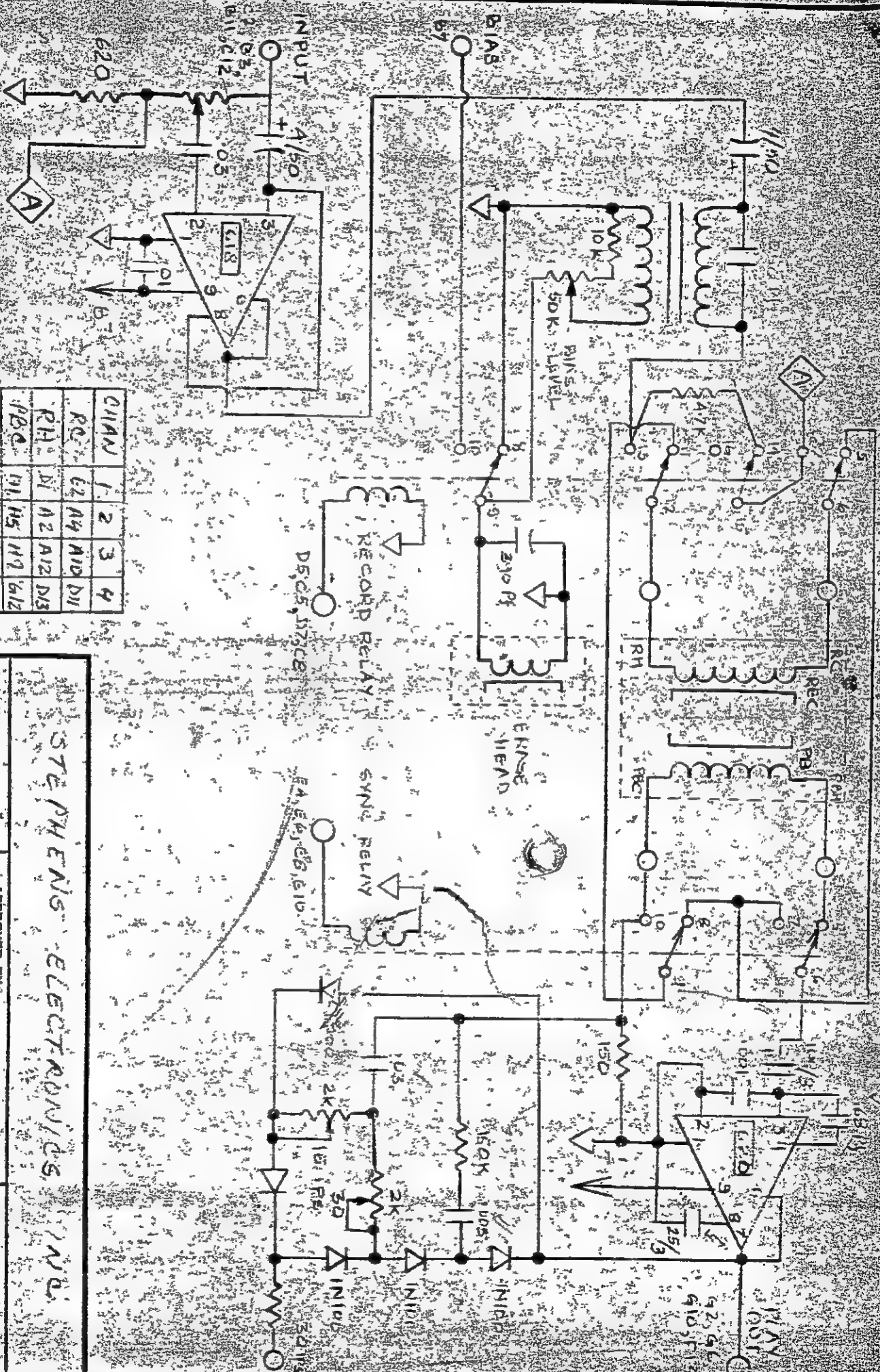
REVISED: 3/2/73

PRE-AMP ELECTRONICS

844-D 3100

110912-C

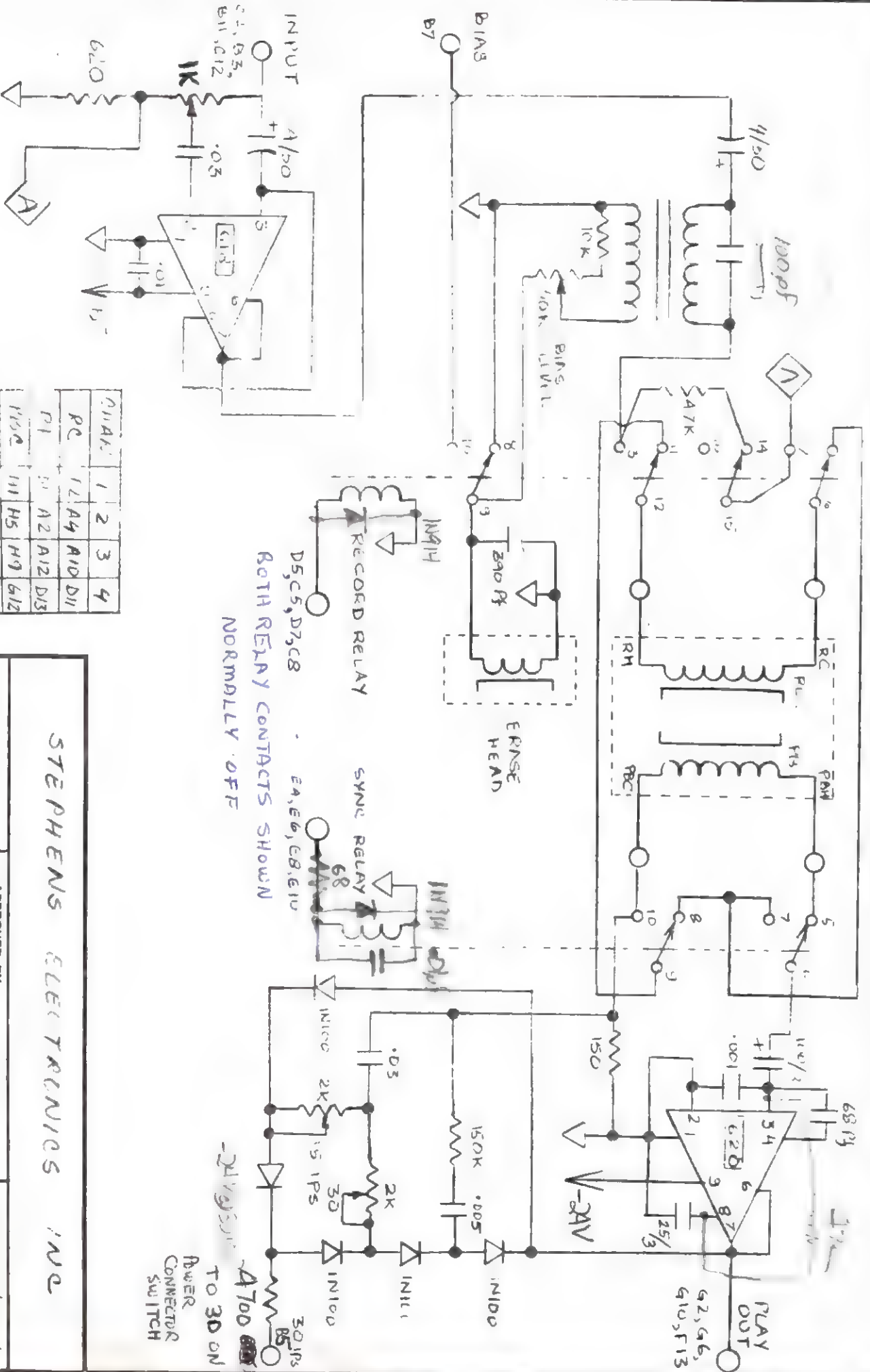




CHAN	1	2	3	4
REC	62	A4	A10	D11
RH	D1	A2	A12	D13
PBC	D1	H5	H12	G12
PH	H3	H17	H11	H13
E	D3	H6	A18	D9

MANUFACTURED BY
STEPHENS ELECTRONICS
INC. 1109 1/2 A

STEPHENS ELECTRONICS INC.	
SCALE:	APPROVED BY:
DATE: 6/6/75	DRAWN BY: L. L. L.
PRE AMPLIFIER ELECTRONICS	
811D	DRAWING NUMBER
1109 1/2 A	REVISED



Q1A4	1	2	3	4
PC	12	A4	A10	D11
P1	5	A2	A12	D3
H5C	11	H5	H9	612
H4H	H3	H7	H11	H13
6	D3	A6	A8	D9

TO ME AND STACK

STEPHENS ELECTRONICS INC

BCALE:

APPROVED BY:

DRAWN BY 1001-

DATE: 6/6/75

REVISÉD

THE AMP LECTURE

811-D
3100

DRAWING NUMBER
110912-A



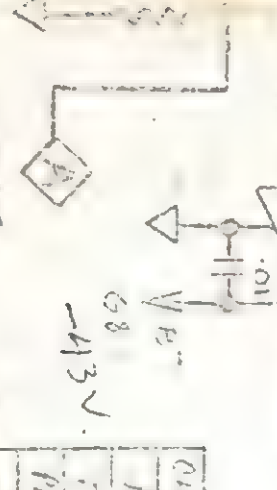
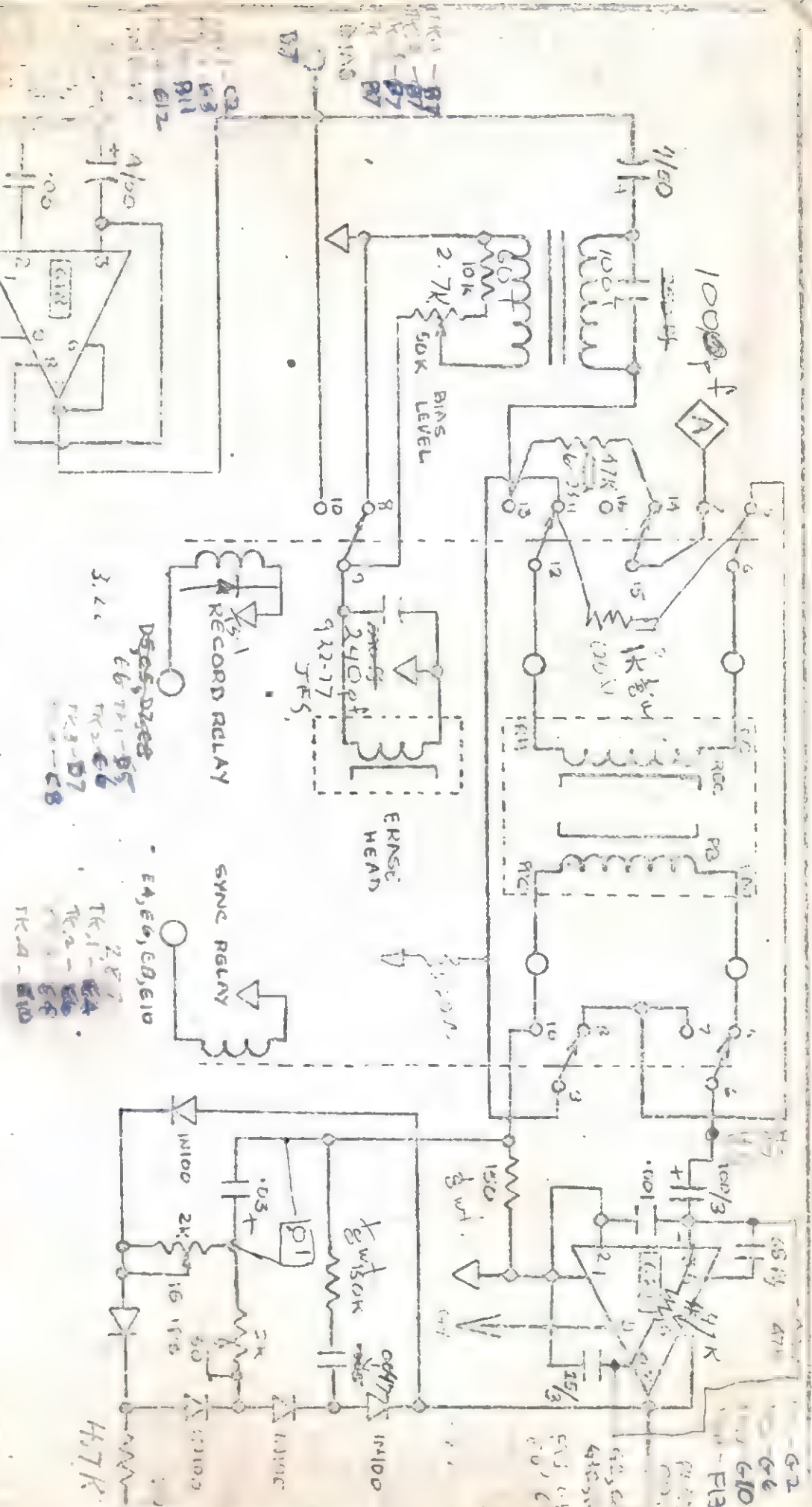
Quadrant	1	2	3	4
P ₁	E ₁ A ₁	A ₁ B ₁	B ₁ C ₁	C ₁ D ₁
P ₂	E ₂ A ₂	A ₂ B ₂	B ₂ C ₂	C ₂ D ₂
P ₃	E ₃ A ₃	A ₃ B ₃	B ₃ C ₃	C ₃ D ₃
P ₄	E ₄ A ₄	A ₄ B ₄	B ₄ C ₄	C ₄ D ₄
P ₅	E ₅ A ₅	A ₅ B ₅	B ₅ C ₅	C ₅ D ₅
P ₆	E ₆ A ₆	A ₆ B ₆	B ₆ C ₆	C ₆ D ₆
P ₇	E ₇ A ₇	A ₇ B ₇	B ₇ C ₇	C ₇ D ₇
P ₈	E ₈ A ₈	A ₈ B ₈	B ₈ C ₈	C ₈ D ₈
P ₉	E ₉ A ₉	A ₉ B ₉	B ₉ C ₉	C ₉ D ₉
P ₁₀	E ₁₀ A ₁₀	A ₁₀ B ₁₀	B ₁₀ C ₁₀	C ₁₀ D ₁₀
P ₁₁	E ₁₁ A ₁₁	A ₁₁ B ₁₁	B ₁₁ C ₁₁	C ₁₁ D ₁₁
P ₁₂	E ₁₂ A ₁₂	A ₁₂ B ₁₂	B ₁₂ C ₁₂	C ₁₂ D ₁₂
P ₁₃	E ₁₃ A ₁₃	A ₁₃ B ₁₃	B ₁₃ C ₁₃	C ₁₃ D ₁₃
P ₁₄	E ₁₄ A ₁₄	A ₁₄ B ₁₄	B ₁₄ C ₁₄	C ₁₄ D ₁₄
P ₁₅	E ₁₅ A ₁₅	A ₁₅ B ₁₅	B ₁₅ C ₁₅	C ₁₅ D ₁₅
P ₁₆	E ₁₆ A ₁₆	A ₁₆ B ₁₆	B ₁₆ C ₁₆	C ₁₆ D ₁₆
P ₁₇	E ₁₇ A ₁₇	A ₁₇ B ₁₇	B ₁₇ C ₁₇	C ₁₇ D ₁₇
P ₁₈	E ₁₈ A ₁₈	A ₁₈ B ₁₈	B ₁₈ C ₁₈	C ₁₈ D ₁₈
P ₁₉	E ₁₉ A ₁₉	A ₁₉ B ₁₉	B ₁₉ C ₁₉	C ₁₉ D ₁₉
P ₂₀	E ₂₀ A ₂₀	A ₂₀ B ₂₀	B ₂₀ C ₂₀	C ₂₀ D ₂₀

DRAWN BY *Chid*
REVISED *3/13*

The Air is very cold

811-A 3100

DRAWING NUMBER
110912-C



Output	1	2	3	4
Rc	32.0V	110.0V	110.0V	110.0V
RL	32.0V	110.0V	110.0V	110.0V
PL	32.0V	110.0V	110.0V	110.0V
PL	32.0V	110.0V	110.0V	110.0V
PL	32.0V	110.0V	110.0V	110.0V
PL	32.0V	110.0V	110.0V	110.0V
PL	32.0V	110.0V	110.0V	110.0V
PL	32.0V	110.0V	110.0V	110.0V
PL	32.0V	110.0V	110.0V	110.0V
PL	32.0V	110.0V	110.0V	110.0V

AMPLIFIER COMPTON
 TWO NUMBERS
 ON SYNCH SIGNAL
 TO HEAD STAKE

STEPHENS ELECTRONICS INC.

PRODUCERS

APPROVED BY: _____

DATE: 6/6/75

High bias freq.

DRAWN BY: L. G. J.

811-D 3100 K11C 87(7) 110912-A

REVISIONS			
LTR	DESCRIPTION	DATE	BY

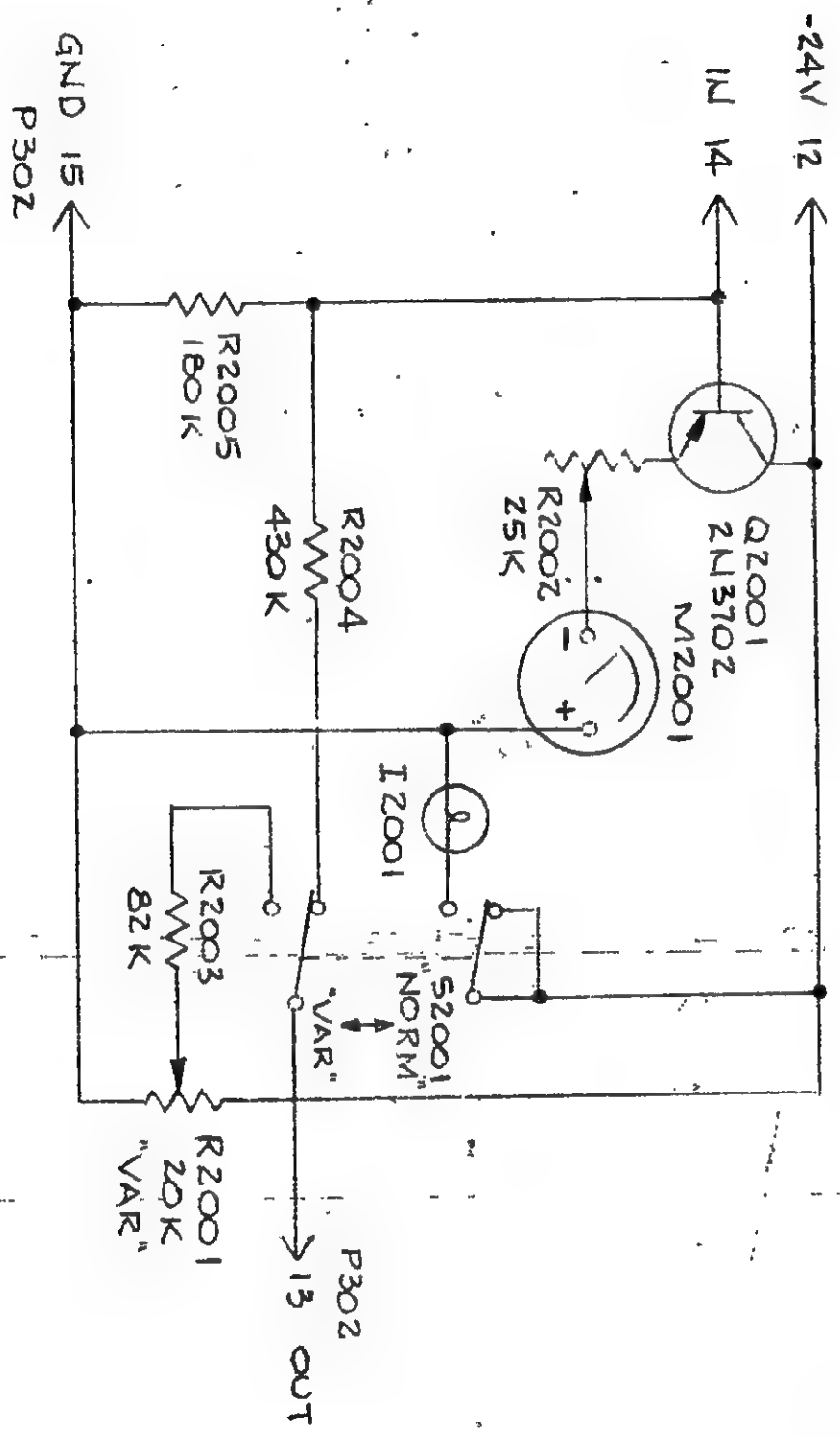


FIGURE 6-17



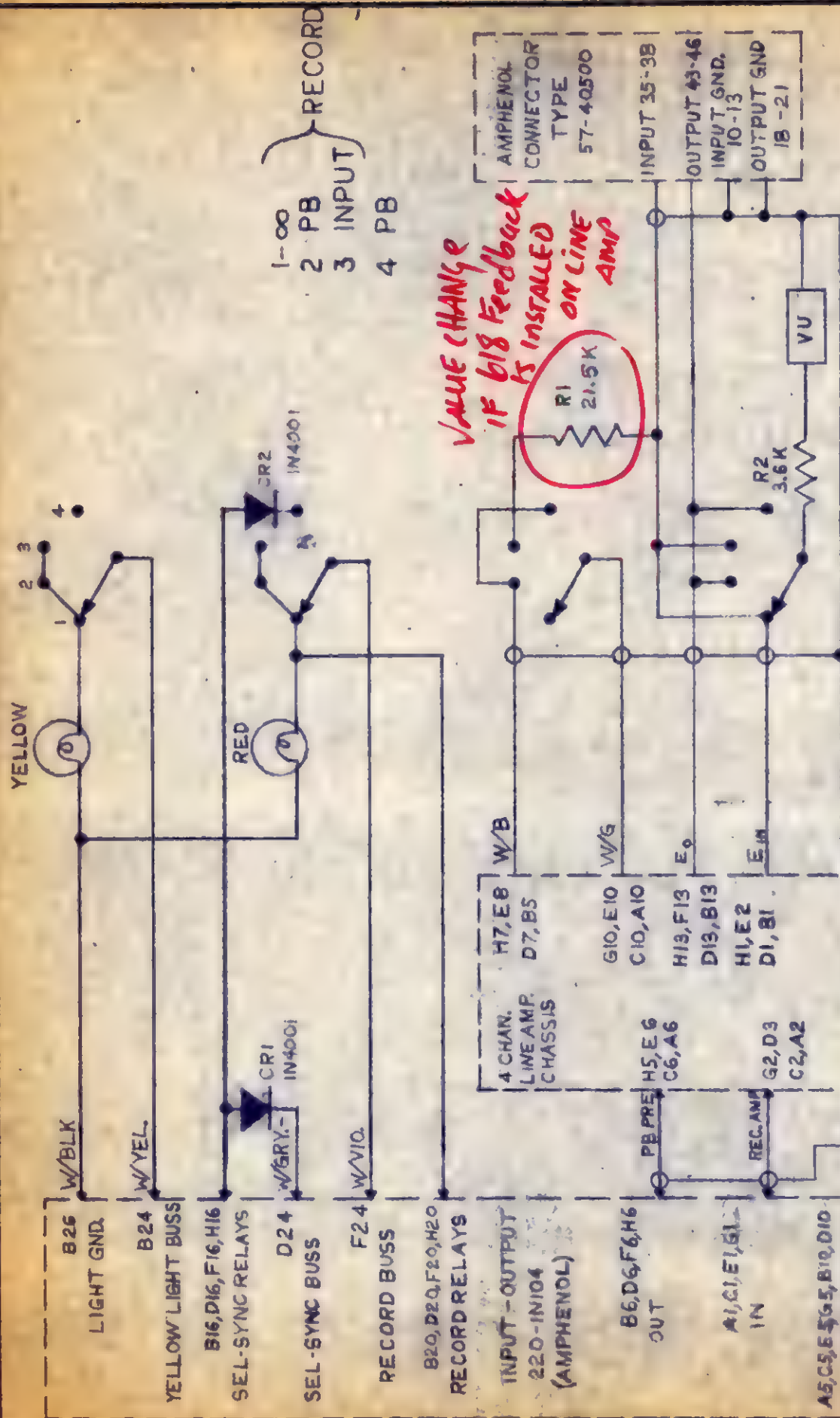
2N3702
BOTTOM VIEW

STEPHENS ELECTRONICS, INC.

SCALE: ~	APPROVED BY:	DRAWN BY: GEIER
DATE: 24 SEP 79		REVISED

VSO MODULE

MODEL 821-B	FIGURE 6-17	DRAWING NUMBER SC-2001
-------------	-------------	---------------------------



STEPHENS ELECTRONICS

SEAL:

APPROVED BY:

DRAWN BY DMS

DATE: 5-30-75

REVISED 8-76-80

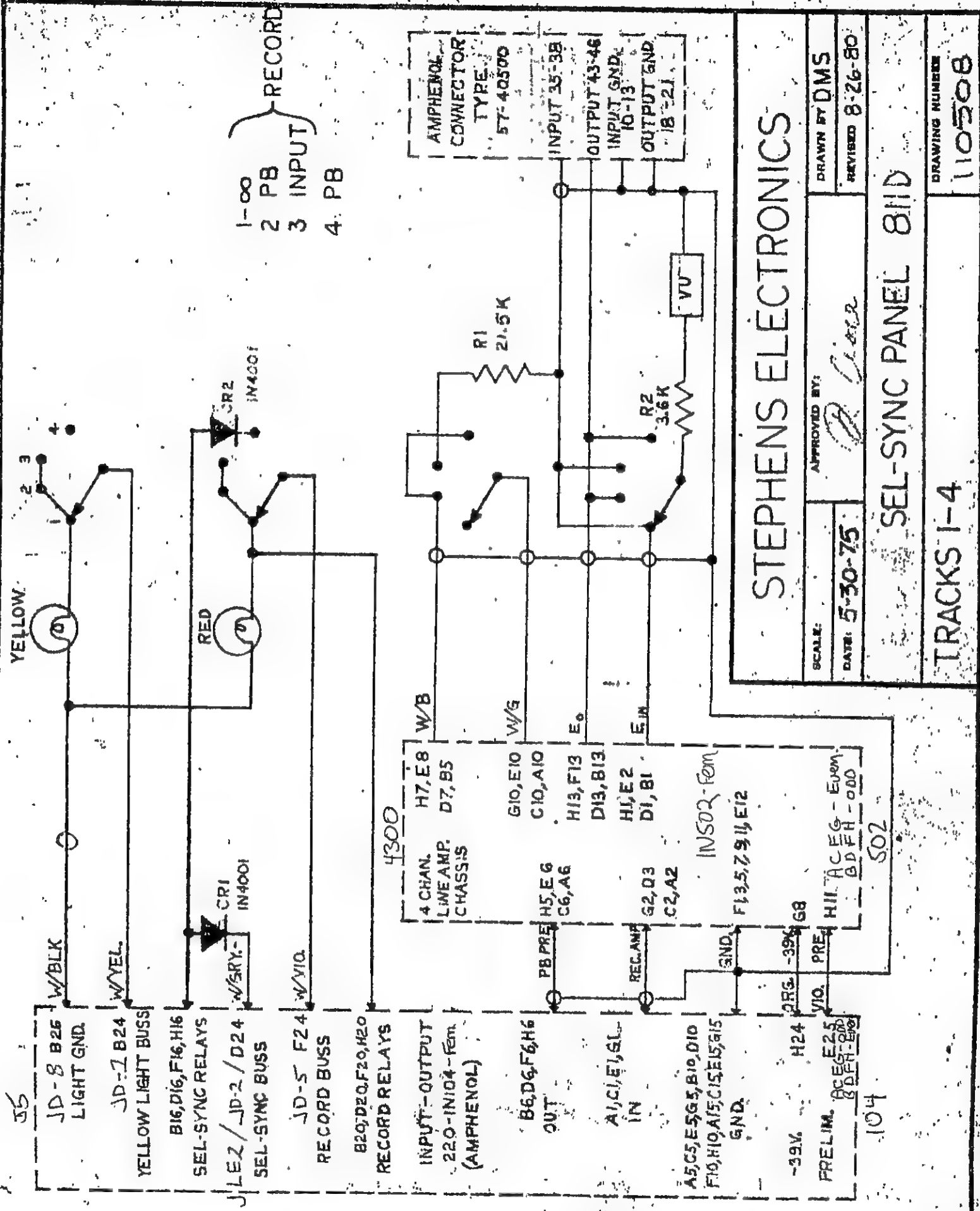
SEL-SYNC PANEL 811D

TRACKS 1-4

DRAWING NUMBER

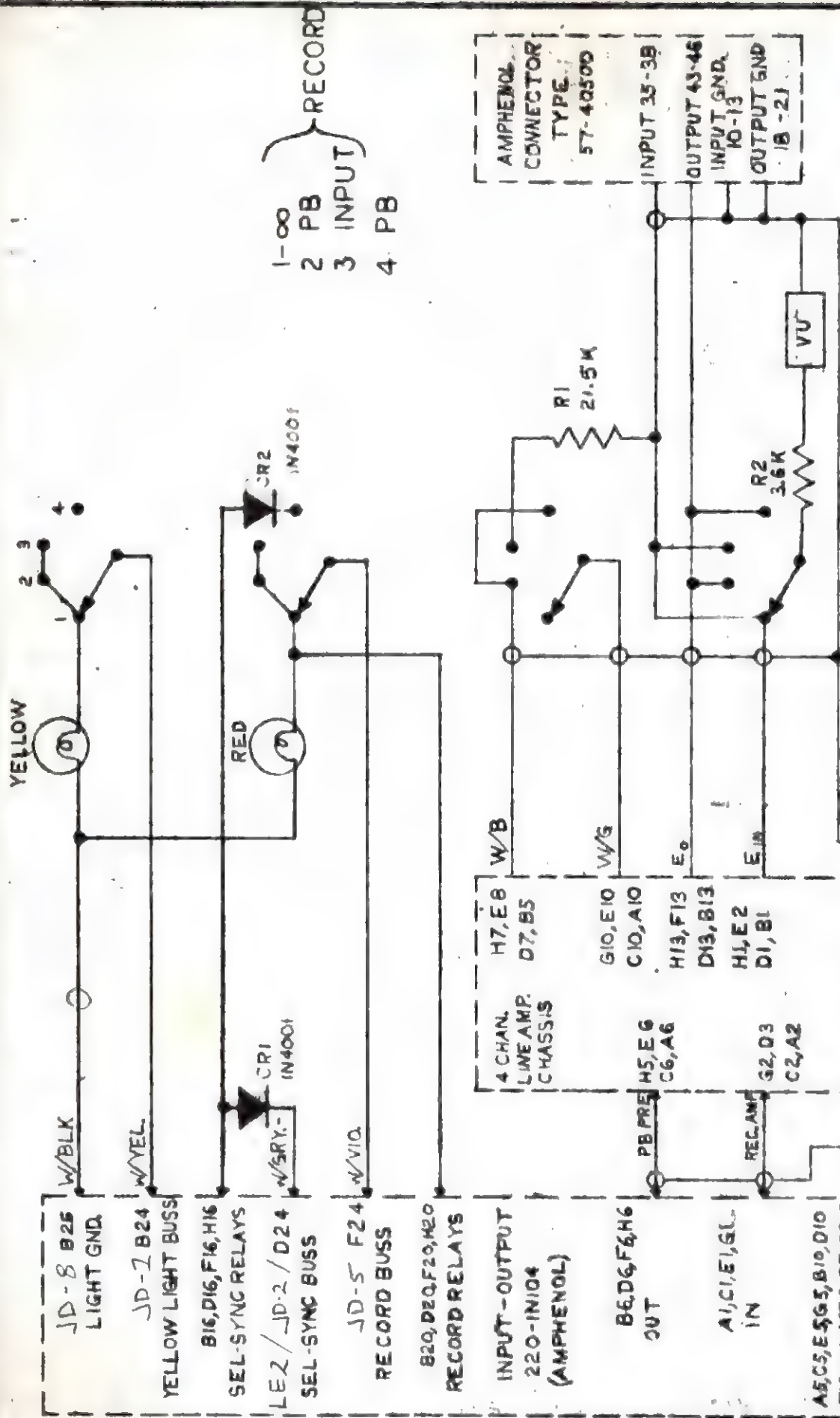
8501

35



STEPHENS ELECTRONICS

SCALE:	APPROVED BY:	DRAWN BY DMS
DATE: 5-30-75	<i>P. Lior</i>	REVISED 8-26-80
SEL-SYNC PANEL 811D		
TRACKS 1-4	DRAWING NUMBER	110508



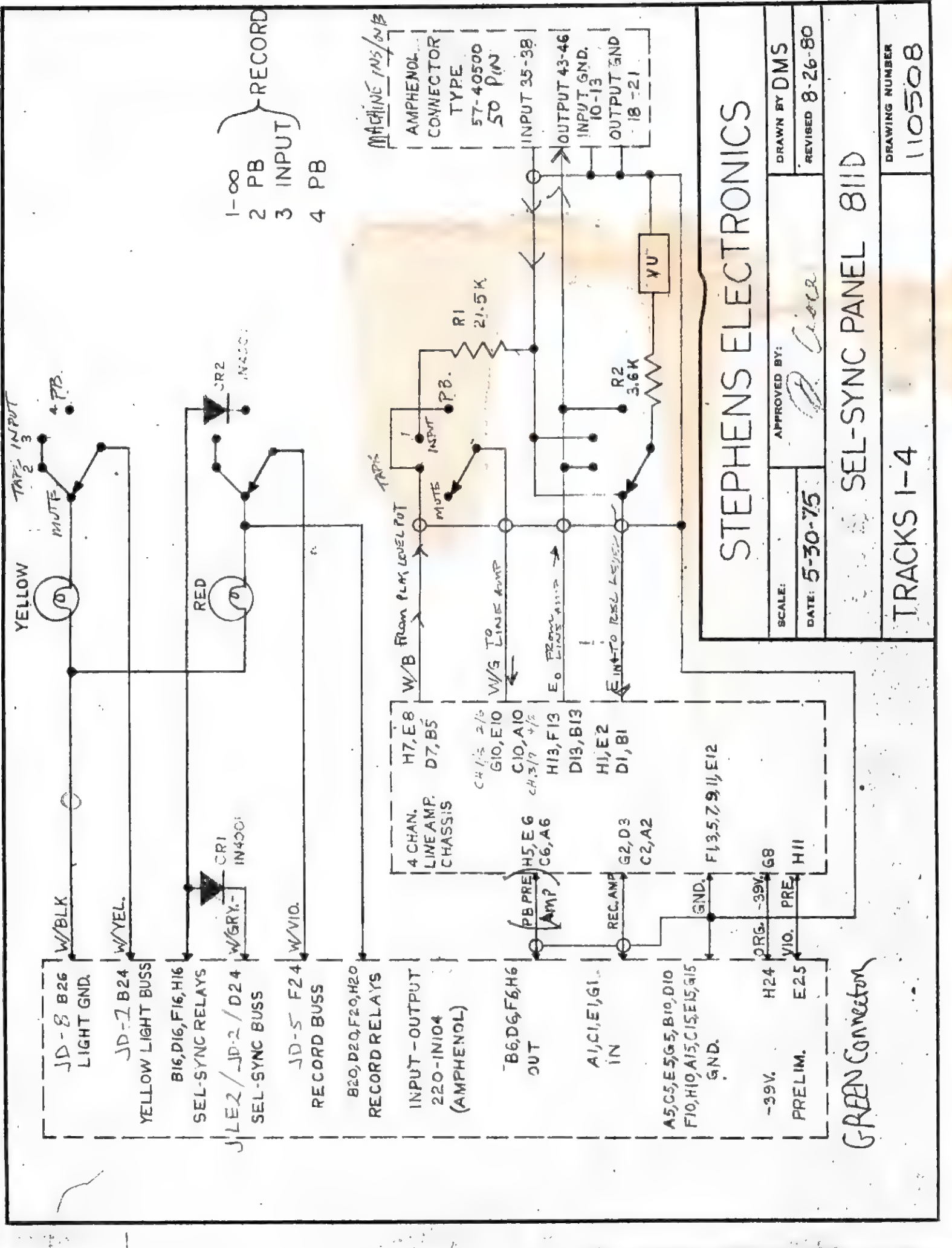
STEPHENS ELECTRONICS

SCALE:
 DATE: 5-30-75
 APPROVED BY: *P. Lior*
 DRAWN BY DMS
 REVISED 8-26-80

SEL-SYNC PANEL 811D

TRACKS 1-4

DRAWING NUMBER
 110508



STEPHENS ELECTRONICS

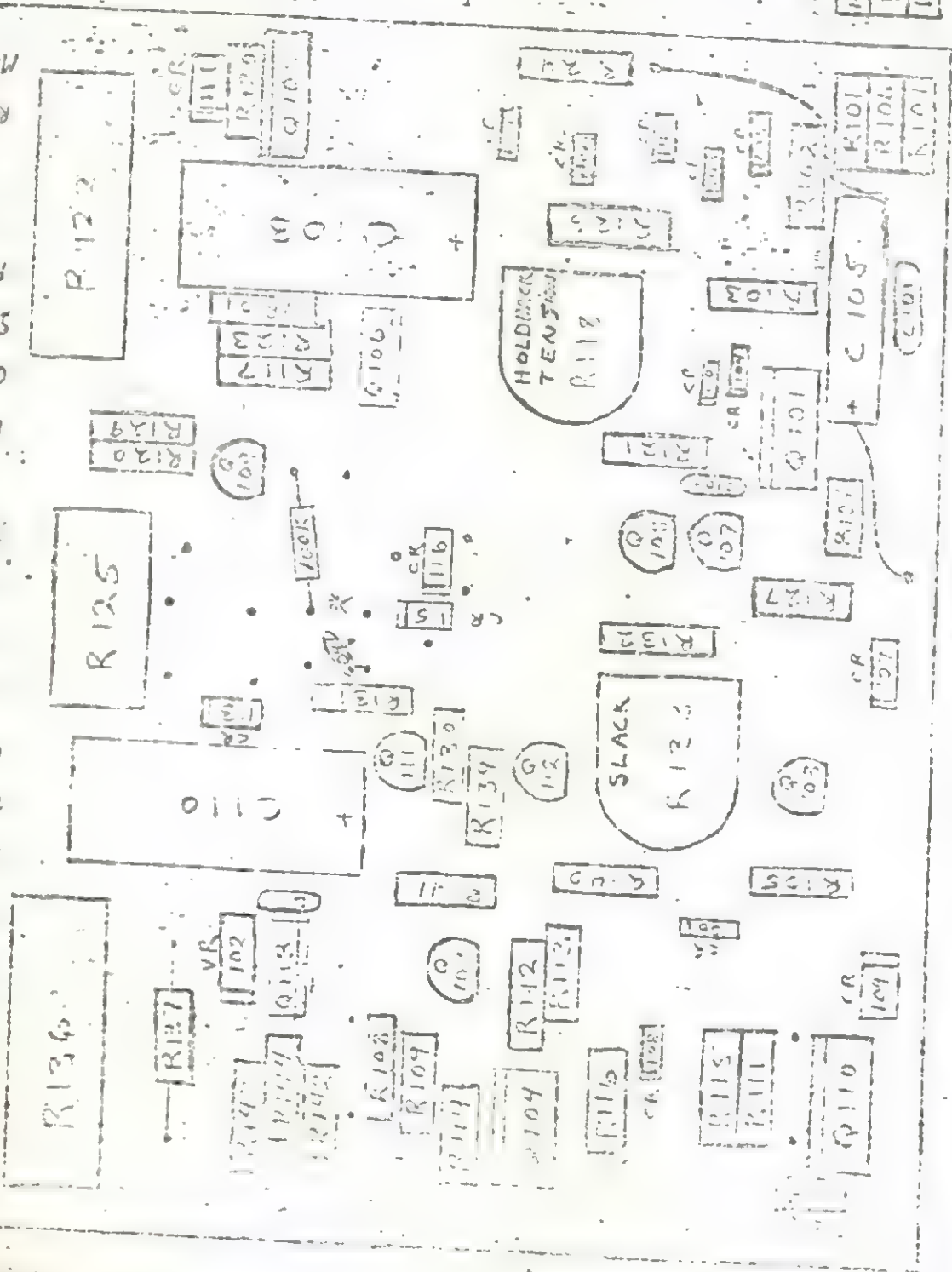
SCALE:
 APPROVED BY: *P. Lora*
 DATE: 5-30-75
 DRAWN BY DMS
 REVISED 8-26-80

SEL-SYNC PANEL 811D

TRACKS 1-4

DRAWING NUMBER
 110508

A - NOTION
 B - REWIND
 C - LOAD
 D - FST FWD
 E - SERVO
 F - COL Q16
 G - BASE
 H - B -
 I - SNO
 J - ENTIRE
 K - ANT
 L - SDC
 M - COL Q12
 N - TRSLT
 O - BASE Q22
 P - GND
 Q - PR CLAMP
 R - PRE
 S - PLAY
 T - M.C.
 U - A.C.
 V - Z



NOT MODIFICATION PARTS IN RED,
 WHICH ARE USED ON NEW MACHINES
 FROM SECOND PAGE FOR PRESENT
 REPORT

STEPHENS ELECTRONICS, INC.

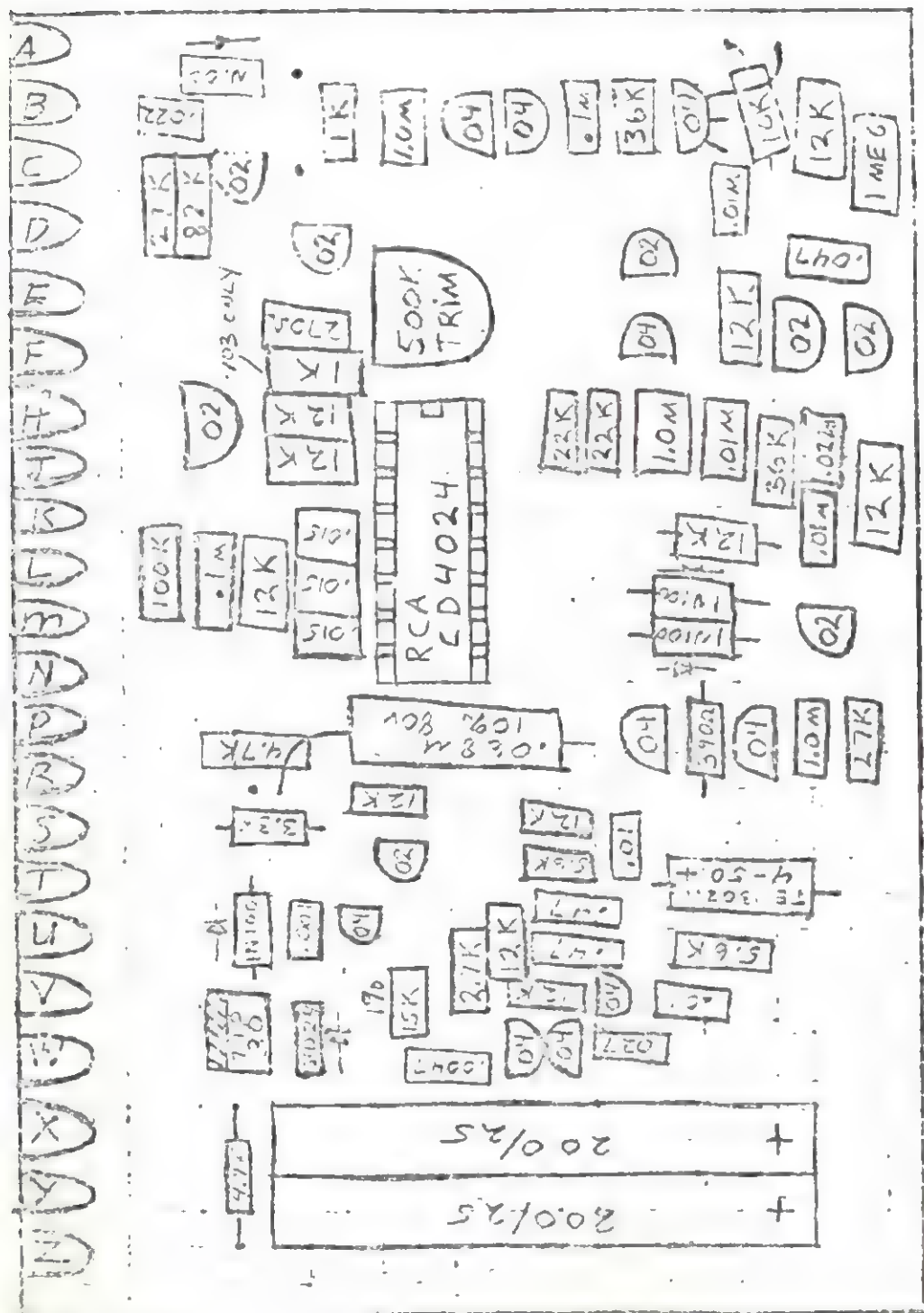
DATE: 10/1/54	APPROVED BY: <i>Artie - Head</i>	DESIGNED BY: <i>Artie</i>
CHECKED BY: <i>Artie</i>		REVIEWED BY: <i>Artie</i>

811D-103

310164

also on 821 24T

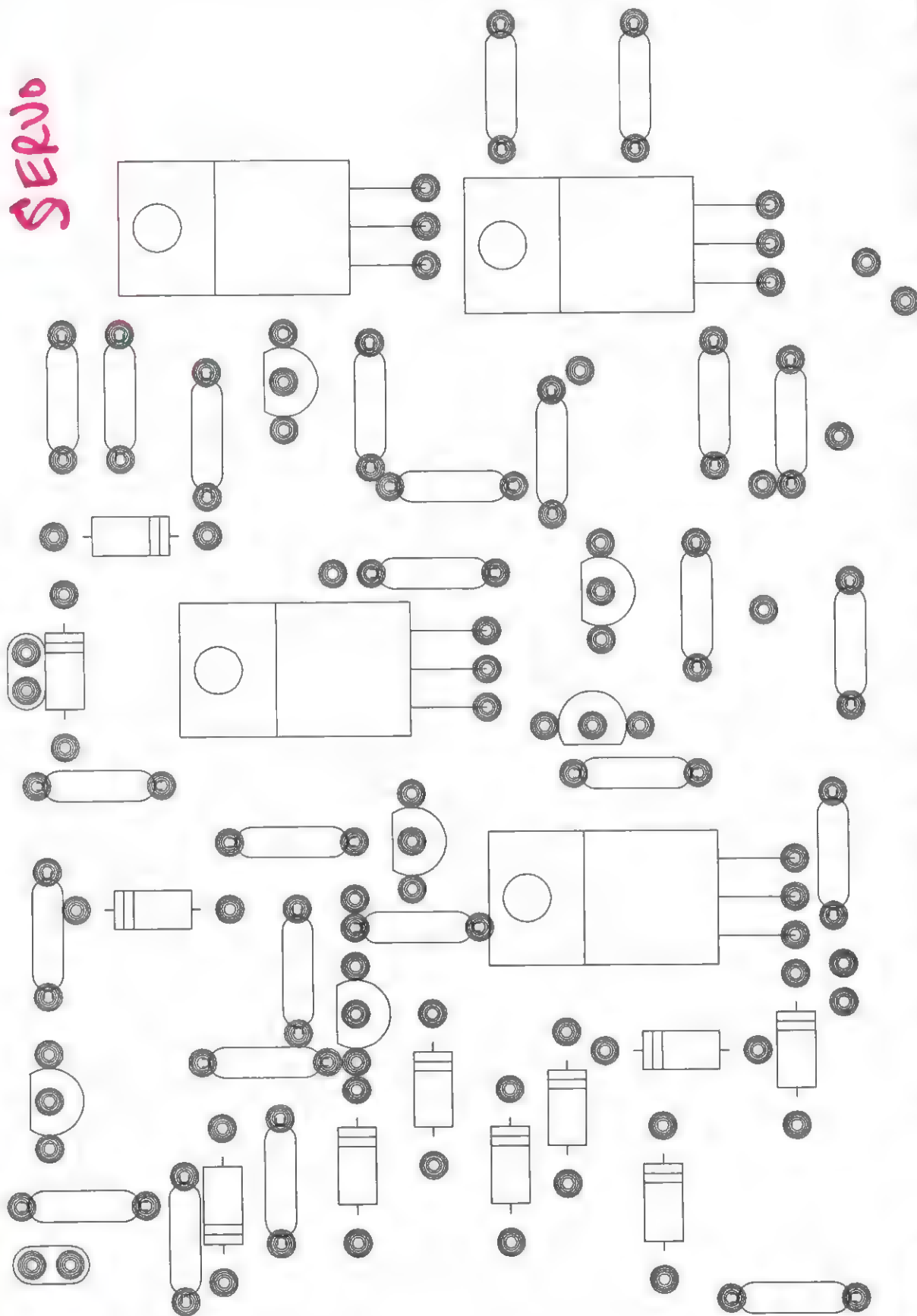
2/3/76

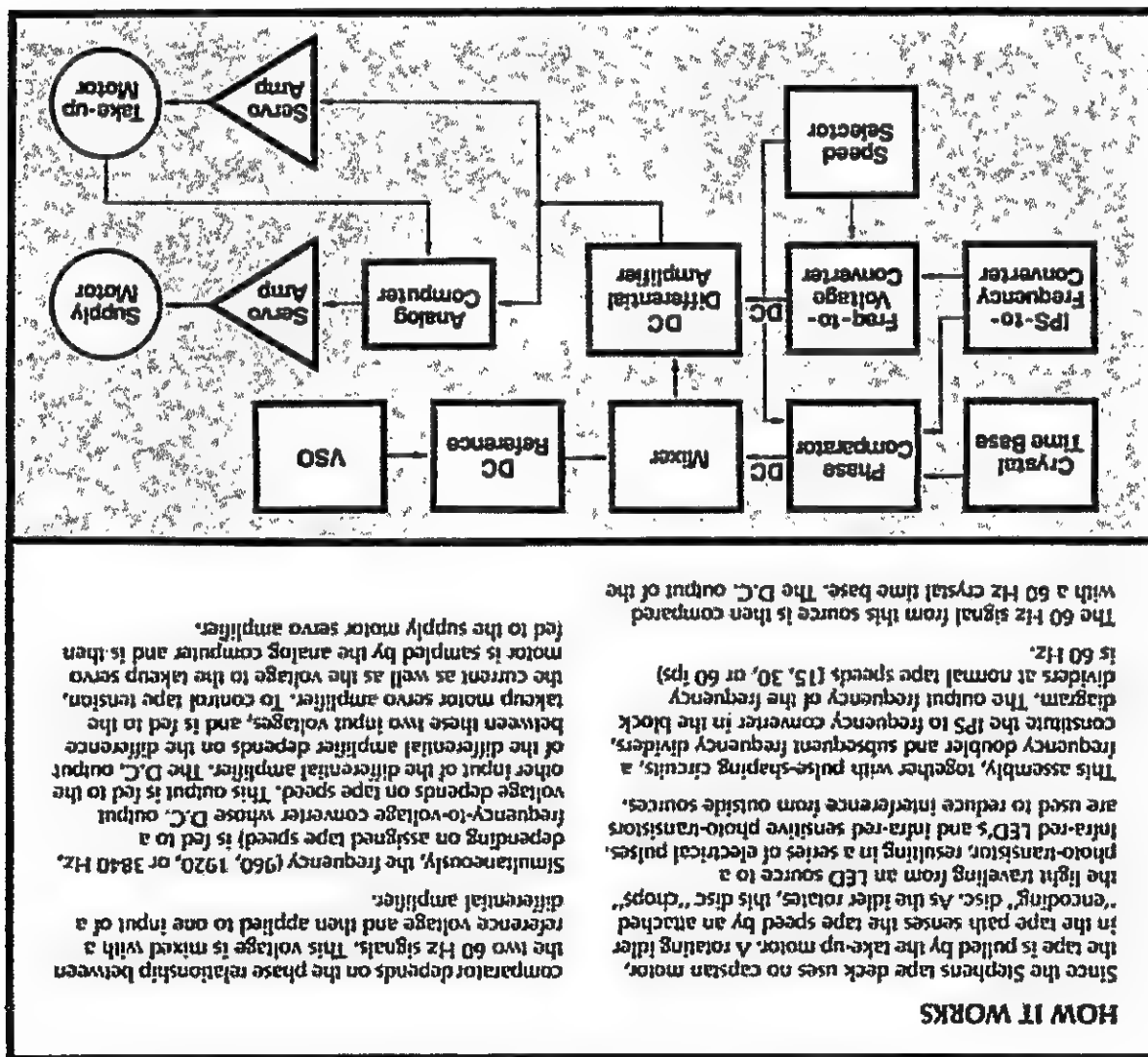


103- ADD 1K

104-20-1K

SERVO







TO:
FROM:
SUBJECT:

PART SOURCES

PARTS AND

310163 CARD

DATE:

7/8/74

CARD # 310163

TOTAL # PER CARD

ITEM	QTY	DESCRIPTION
15.2 1/2"	1	
47.2	2	
100.2	2	
1K.2	8	
1.5K.2	1	
1.8K.2	4	
2K.2	1	
2.7K.2	2	
4.7K.2	2	
7.5K.2	1	
12K.2	1	
15K.2	1	
22K.2	2	
27K.2	3	
36K.2	1	
56K.2	1	
82K.2	1	
150K.2	1	
220K.2	1	

ALLAN BRADLEY
1/4 WT. 10%
(16,15,7)
IF CAUT FWD
GO TO WHITE
(20,25)

ALLAN BRADLEY
DATE # 7408 START DATE (15,23,4,7 20)

DATES (15,23,4,7 20)
(16,7) MC 20.4

IN-17554 2 2D 43B 43K 57

TEXAS INST.
(25,20,18,7)

BARNES
(12,1)

ERIE
(25,18,16)

TRANSISTOR DIODES

CAPS
TRIM
POTS



TO:
FROM:
SUBJECT:

DATE: 7/8/74

RESISTORS

ITEM	TOTAL PER CARD	310163 GANT
1.0	2	8131-050-651-105M
47/50K	1	8131-050-651-474M
.047	1	8121-100-651-473M
35/50	2	TE 1306
150/25	1	TE 1212
CARD # 310164		
270K	1	
390K	1	
1K	2	
1.8K	1	
2K	1	
2.7K	3	
3.3K	2	
4.7K	3	
5.6K	2	
12K	10	
18K	1	
22K	1	
36K	2	
47K	11	
100K	11	
1M	2	

ALCAN BRADLEY
1/4 WT. 1090
(16,15,7)
OHMITE
OR IF CAUT FWD
1/4 WT. 1090 (20,25)

RN55C (29)
BARNES (12)
ERIE (25,18,16)

POTS
CAPACITORS

15K	19	8155C1502F
40.2K	19	8155C4022
10K		BARNES
.001	1	8121-100-W5R0-102K
.0047		8121-100-W5R0-472K
.015	3	8121-050-651-453M
.022	1	8121-050-651-223M
.027	2	8121-050-651-273M
.01		8121-100-W5R0-103K
1		8131-100-W5R0-104K



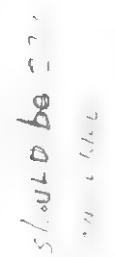
TO:
FROM:
SUBJECT:

DATE: 7/8/74

310164 CONT

ITEM	TOTAL # / CARD	ORDERING INFO
47/50V	2 8.13-050-651-474M	PRICE (25,18,16)
1.0/50V	3 8.13-050-651-105M	
0.68/80V	1 10%	
4/50	1 1302 IL	
200/25	2 500D2076025DH7	
1N100A	4	DIODES
1N4749A	4	MOTROLA 2D (8,16,7) (8 upward)
2N3702	9	TRANSISTORS
2N3704	9	TEXAS INSTR. (25,20,18)
TIP30	1	IC'S - (13,18,16,18)
1C	1 CD4004	RCA

SEMICONDUCTORS



APPROVED BY:

SCALE. 2:1

SCALE: 2:1

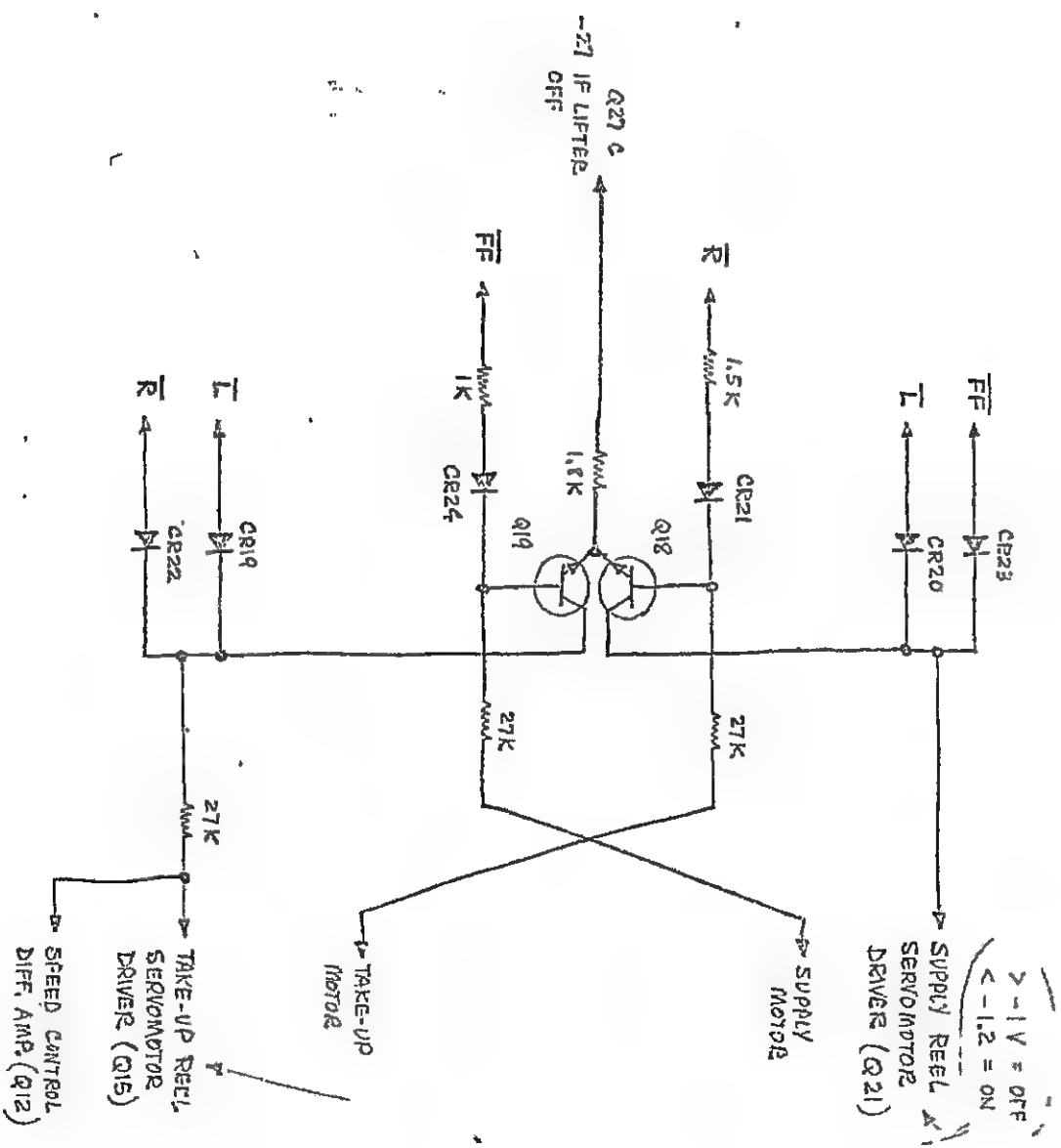
DRAWN BY

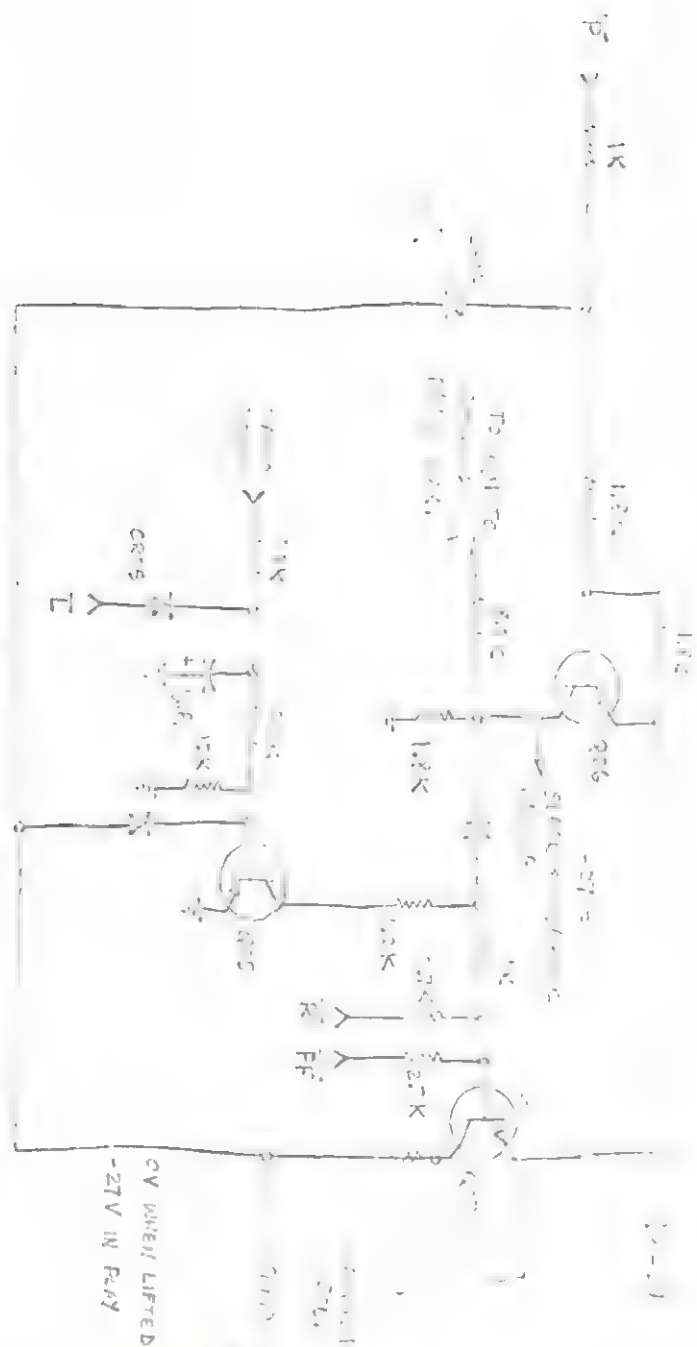
REVISED 6-15-73

DRAWING NUMBER

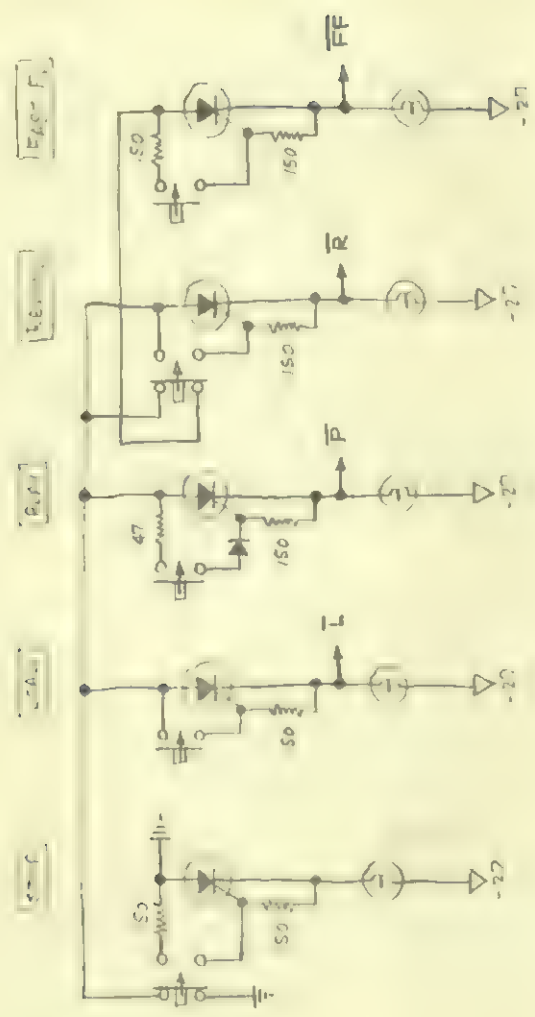
31067

SIMPLIFIED SERVO LOGIC CIRCUIT



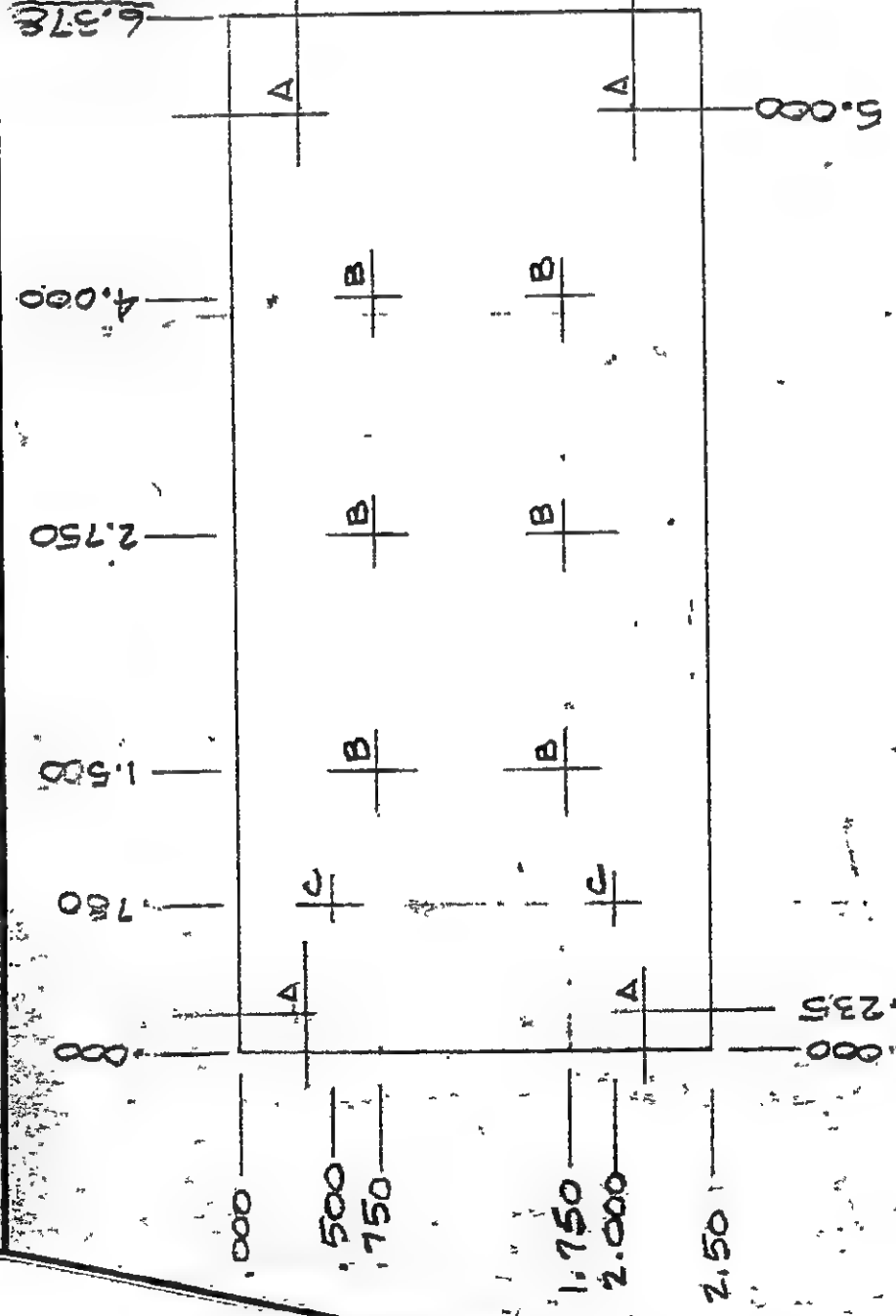


SIMPLIFIED CIRCUIT NOT SHOWN
 COMMUTATING CAPS





REVISIONS		
SYM	DESCRIPTION	DATE
A	LENGTH WAS 5.490 DWG. NOT TO SCALE	4/7/72
B	ADDED C HOLES	10/16/73
	---.000 C MODEL WAS 811D-103	6/18/80



MAT'L - .090 THK ALUM 6061-T6
 FINISH - ALODINE
 XX = ±.010 XXX = ±.005

STEPHENS ELECTRONICS, INC

SCALE: FULL	APPROVED BY:	DRAWN BY: GIER
DATE: 1/9/72		REVISED 7-1-82

DECK PANEL - RIGHT LOWER

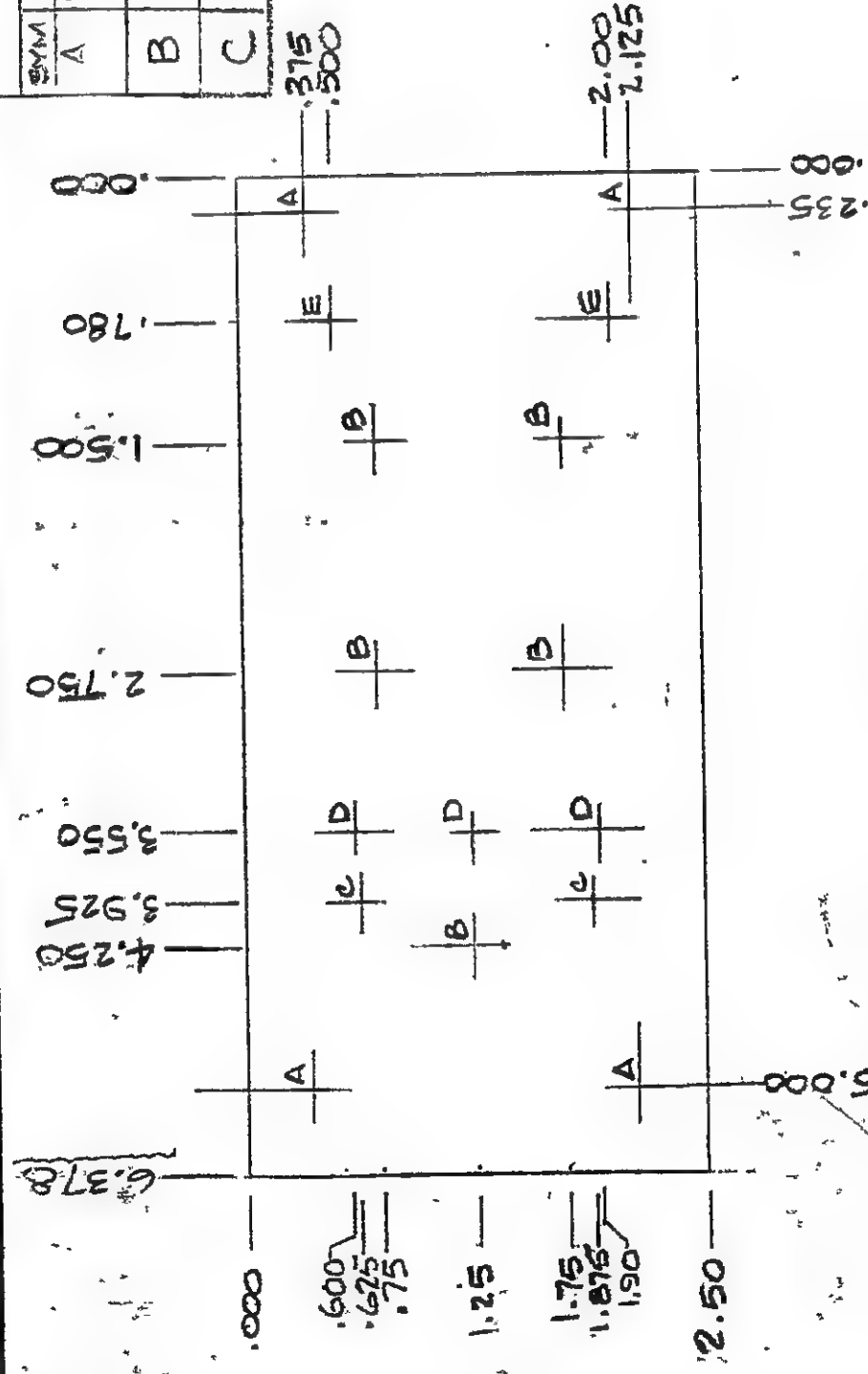
MODELS C 103 & 104	DRAWING NUMBER REV
	1101080

A = DRILL & C'SINK FOR 6-32
 FL. HD. SCREW

* B = .625 DIA.
 C = DRILL & C'SINK FOR B-32
 FL. HD. SCREW (COVER SIZE HOLE)

* NOTE: HOLES PATTERN OF
 "B" HOLES MUST MATCH
 WITH PART NO. A10106

REVISIONS		
SYM	DESCRIPTION	DATE
A	LENGTH WAS 5.430 DWG. NOT TO SCALE	4/17/72
B	ADDED C, D, & E HOLES	12/6/73
C	MODEL WAS 811D-103	6/18/80



- A = DRILL & C/SINK FOR 6-32 FL. HD. SCREW
- B = .625" DIA.
- C = DRILL & C/SINK FOR 4-40 FL. HD. SCREW
- D = DRILL #27 (.144)
- E = DRILL & C/SINK FOR 8-32 FL. HD. SCREW
(OVERSIZE HOLE)

MAT'L = .090 THK ALUM 6061-T6
 FINISH: ALODINE
 XX = ±.010 XXX = ±.005

STEPHEN'S ELECTRONICS, INC.

SCALE: FULL	APPROVED BY:	DRAWN BY: GEPER
DATE: 1/19/72		REVIEWED:
DECK PANEL - LEFT LOWER		
MODELS 103 & 104	DRAWING NUMBER: 1010107	

* NOTE = HOLE PATTERN OF
 B HOLES MUST MATCH
 WITH PART NO. A10103



STEPHENS ELECTRONICS, INC

3513 PACIFIC AVENUE, BURBANK, CALIFORNIA 91505

PHONE: (213) 842-5116

ENGINEERING COMMUNIQUE #3

JULY 21, 1980

RE: The discrepancy in high frequency record calibration
when using high output tapes.

The purpose of this communique is to discuss the problem of playing back 10 kHz at zero level at 15 ips when the recorder is aligned to the NAB standard.

The original 15 ips standard included compensation for high frequency bias loss (erasure). Through the years, the NAB standard tapes have been re-calibrated to compensate for drift made in the original calibrations. Due to the improved efficiency of the top end of the latest high output tapes (Ampex 456 for example), the playback response may be +1 dB or more at 10 kHz even with no record equalization on Stephens recorder/reproducers. This is due to our superior high frequency record response.

It has come to our attention that we are not the only ones having this problem. The NAB standard for 15 ips is again in need of re-calibration. An AES Committee recognizes this and the new standard tapes may closely match the European CCIR curve.

SEI suggests in the meanwhile calibrating the playback equalization at 10 kHz to be -2 dB when referenced to 1 kHz when playing back a standard alignment tape. The alternative is to insert a high frequency roll-off network in the record electronics for compensation. This would introduce additional phase shift and a reduction in the high frequency signal-to-noise ratio.

If you have any questions please call us. We would also appreciate your response to our solution.

STEPHENS ELECTRONICS, INC.

Doug Cioce
Director of Operations



STEPHENS ELECTRONICS, INC

3513 PACIFIC AVENUE, BURBANK, CALIFORNIA 91505

PHONE: (213) 842-5116

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STEPHENS ELECTRONICS, INC.

Doug Cioce
Director of Operations



STEPHENS ELECTRONICS, INC

3513 PACIFIC AVENUE, BURBANK, CALIFORNIA 91505

PHONE: (213) 842-5116

ENGINEERING COMMUNIQUE #4

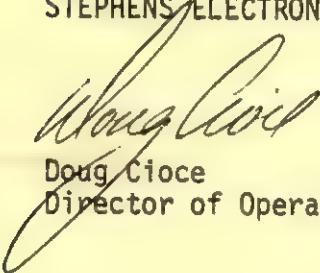
AUGUST 28, 1980

RE: Cleaning/Polishing Solutions

It has been brought to our attention that Bell Labs has issued a report on cleaning/polishing solutions containing silicone and their detrimental effect on electrical contacts. Their findings indicate that the silicone used in these solutions has a corrosive effect on electrical contacts causing erosion and pitting, therefore leading to an intermittent connection.

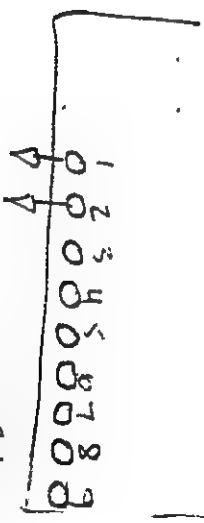
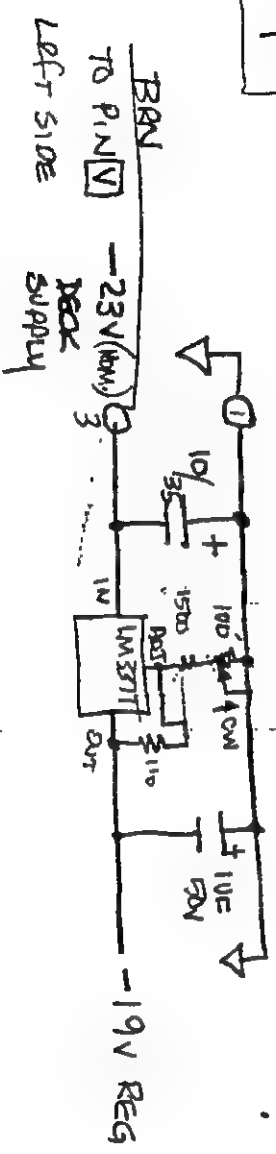
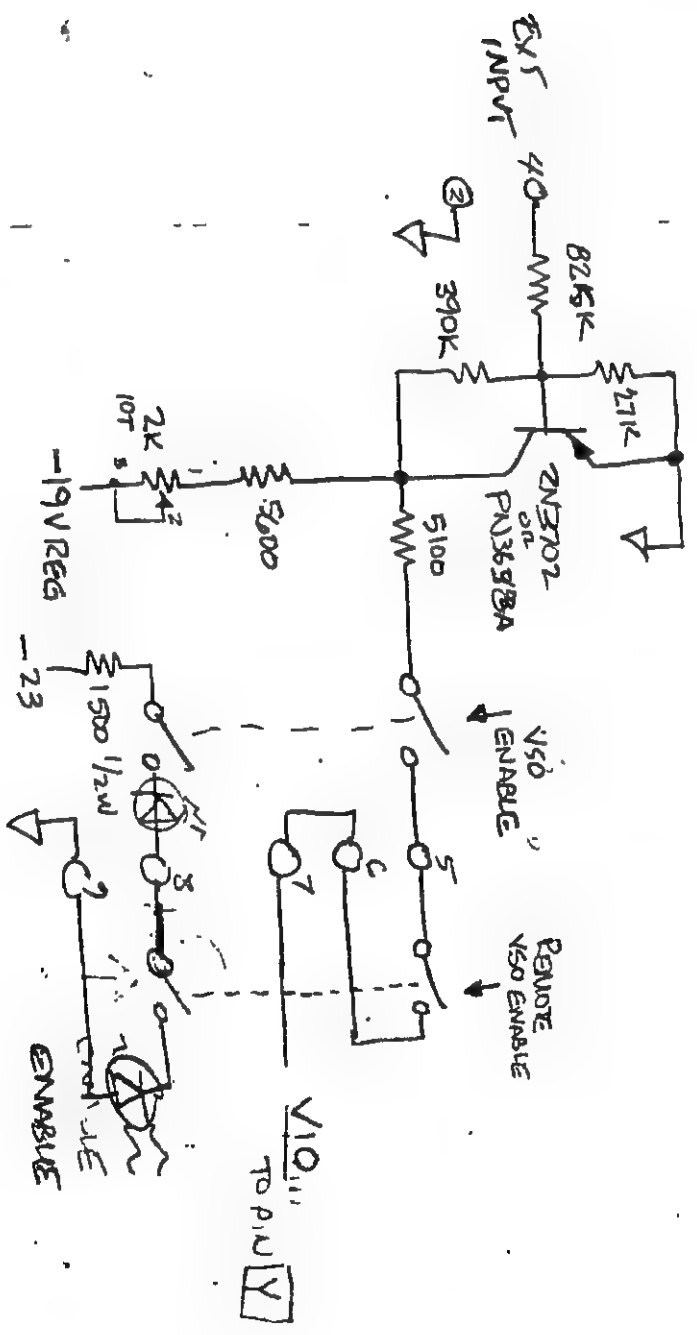
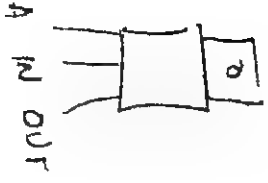
We therefore recommend that no cleaning/polishing solutions containing silicone be used in the cleaning of Stephens Recorders/Reproducers.

STEPHENS ELECTRONICS, INC.

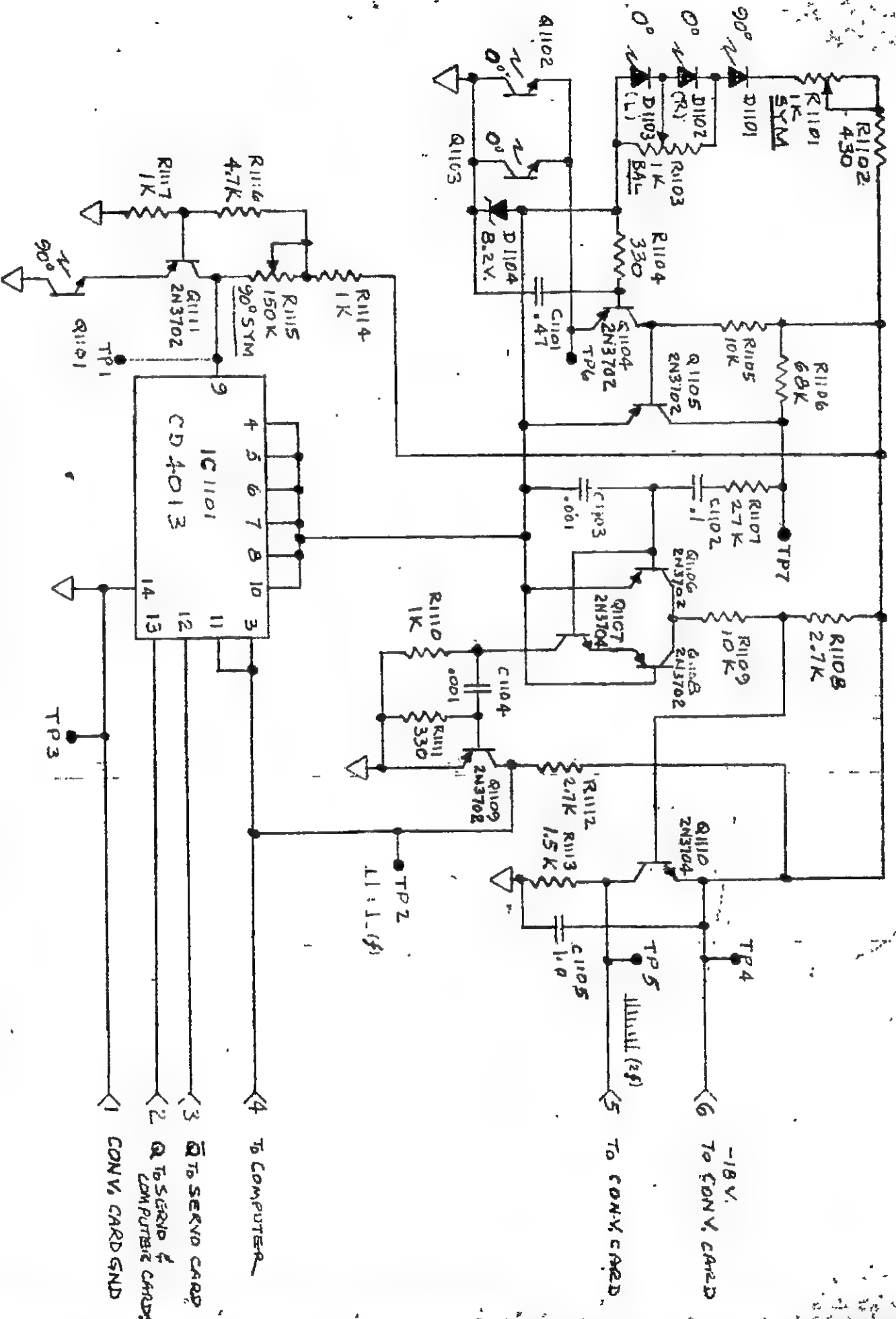


Doug Cioce
Director of Operations

$+0.564 = -16.07$
 $-0.42 = -12.75$
 $-1.365 = -9.53$



STEPHEN'S INTERFAC

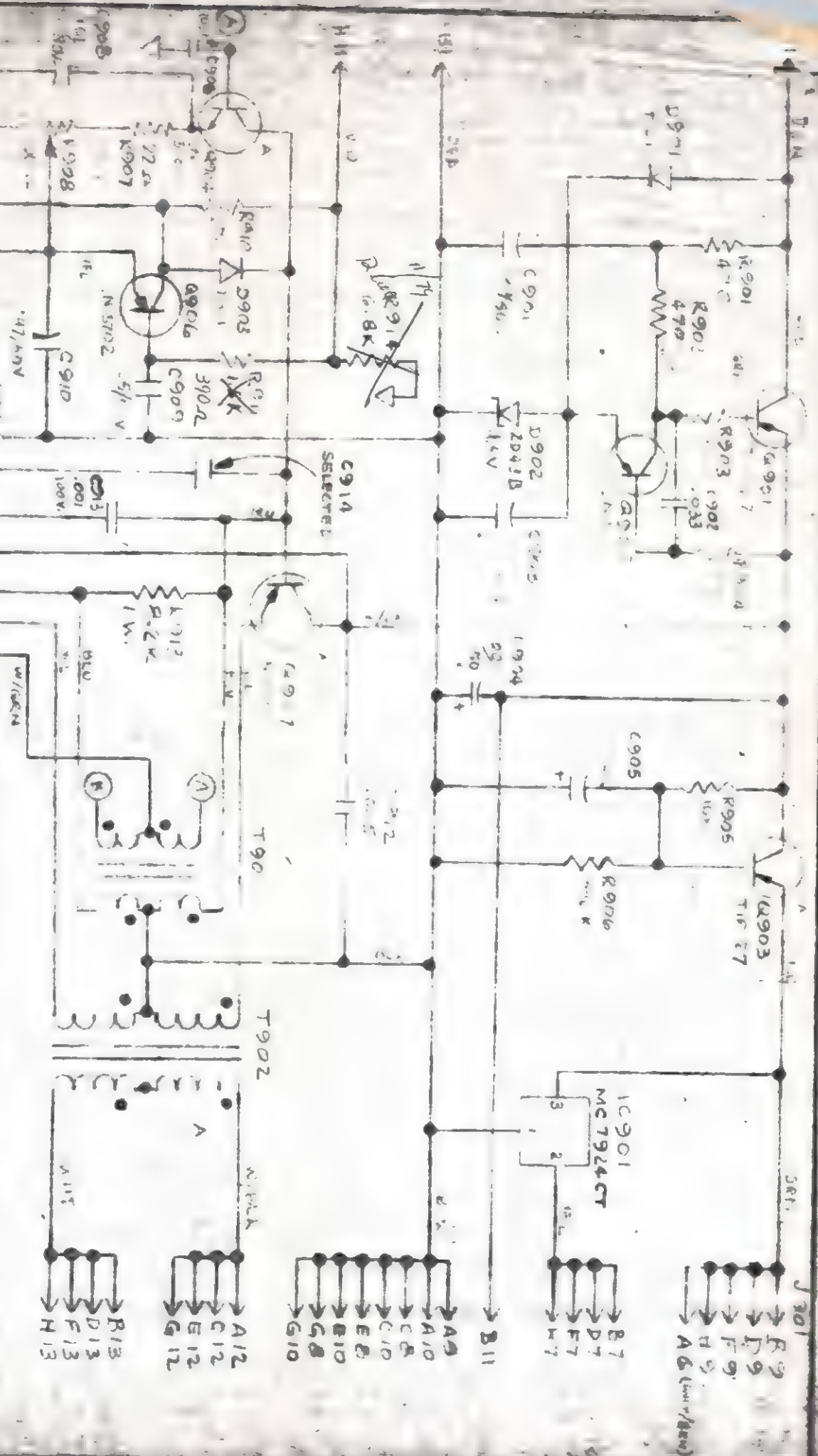


SCHEMATIC, SENSOR INTERFACE CARD AND SENSORS

FIGURE 6-10

3C-1101

6/18/79 PB
 Aug 7/30/79 AB



ST. PIENS ELECTRONICS

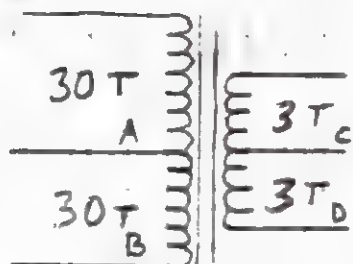
SCALE: —
 DATE: 3/14/75
 APPROVED BY: *[Signature]* 3/13/79
 DRAWN BY: LALAT
 REVISED: 3/10/79

BID BIAS AND P/S REGULATOR

DRAWING NUMBER
 10000-C

9/12/74 RANBY

BIAS CHASSIS COILS O.S.C. TRANS

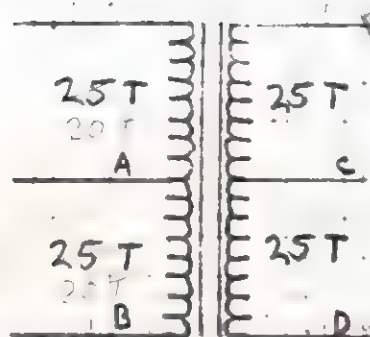


30 TURNS OF #24 SOLID ENAMEL COATED
WIRE BELDON #8052

3 TURNS OF #26 SOLID ENAMEL COATED
WIRE BELDON #~~8065~~ 8065

WIND 2 WIRES AT A TIME, THE
30 #24'S 1ST, THEN THE 3'S
BOBIN # 2616 PCB1 SEPERATED BY TAPE
CORE # 2616P A100-3D3

STANDARD OUTPUT - ERASE



25 TURNS OF #24 SOLID ENAMEL COATED
WIRE BELDON #8052

WIND 4 WIRES AT ONE TIME

CUT THE 4 WIRES TO A LENGTH OF
56 INCHES BEFORE TURNING

BOBIN # 2616 PCB1

CORE # 2616 PL100 3B7

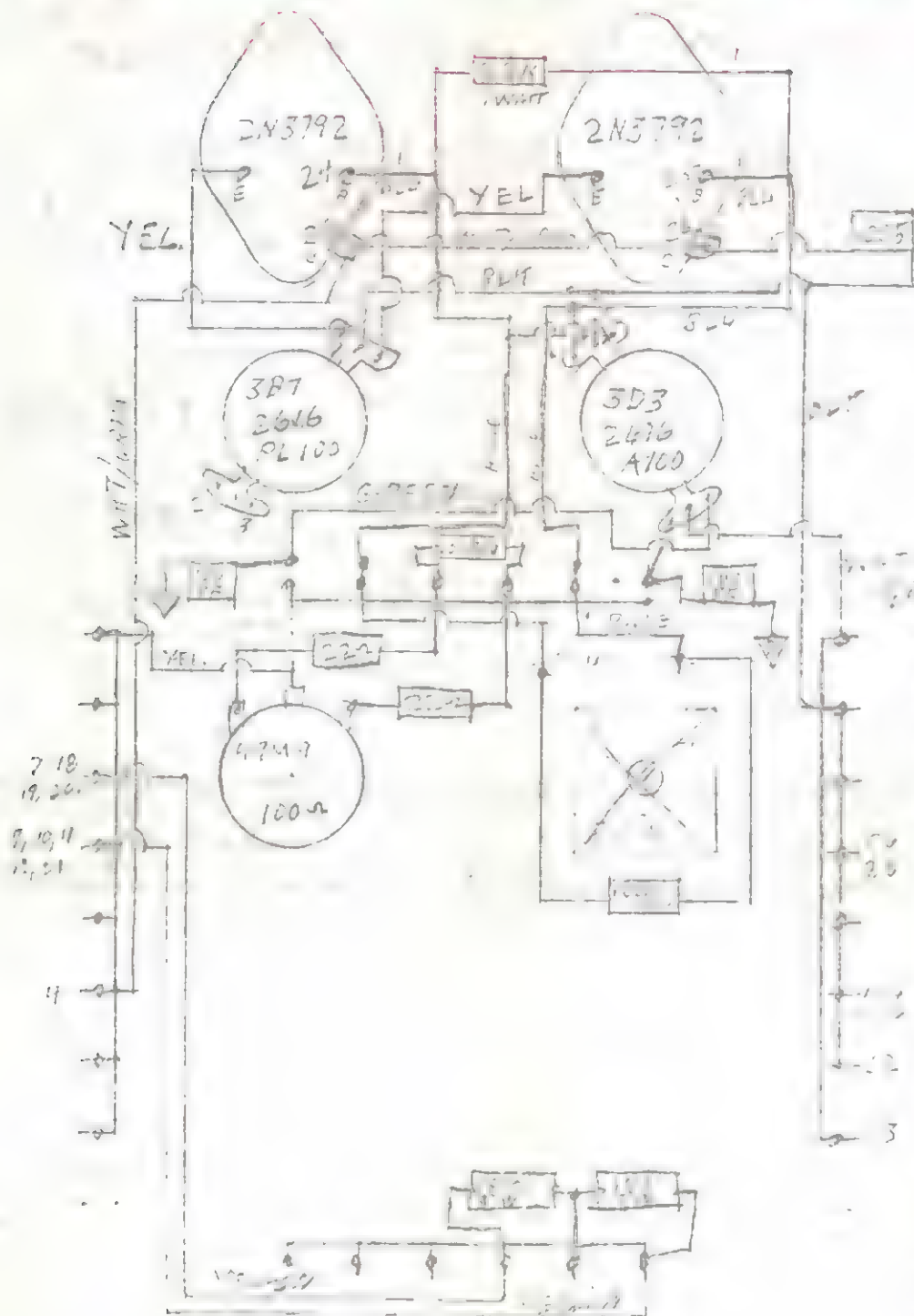
CORES AND BOBINS FROM FERROXCLUBE CORP.



WRAP COILS WITH TAPE
WHEN FINISHED AND
CHECK FOR GOOD FIT
IN CORES.

223 225
223 225

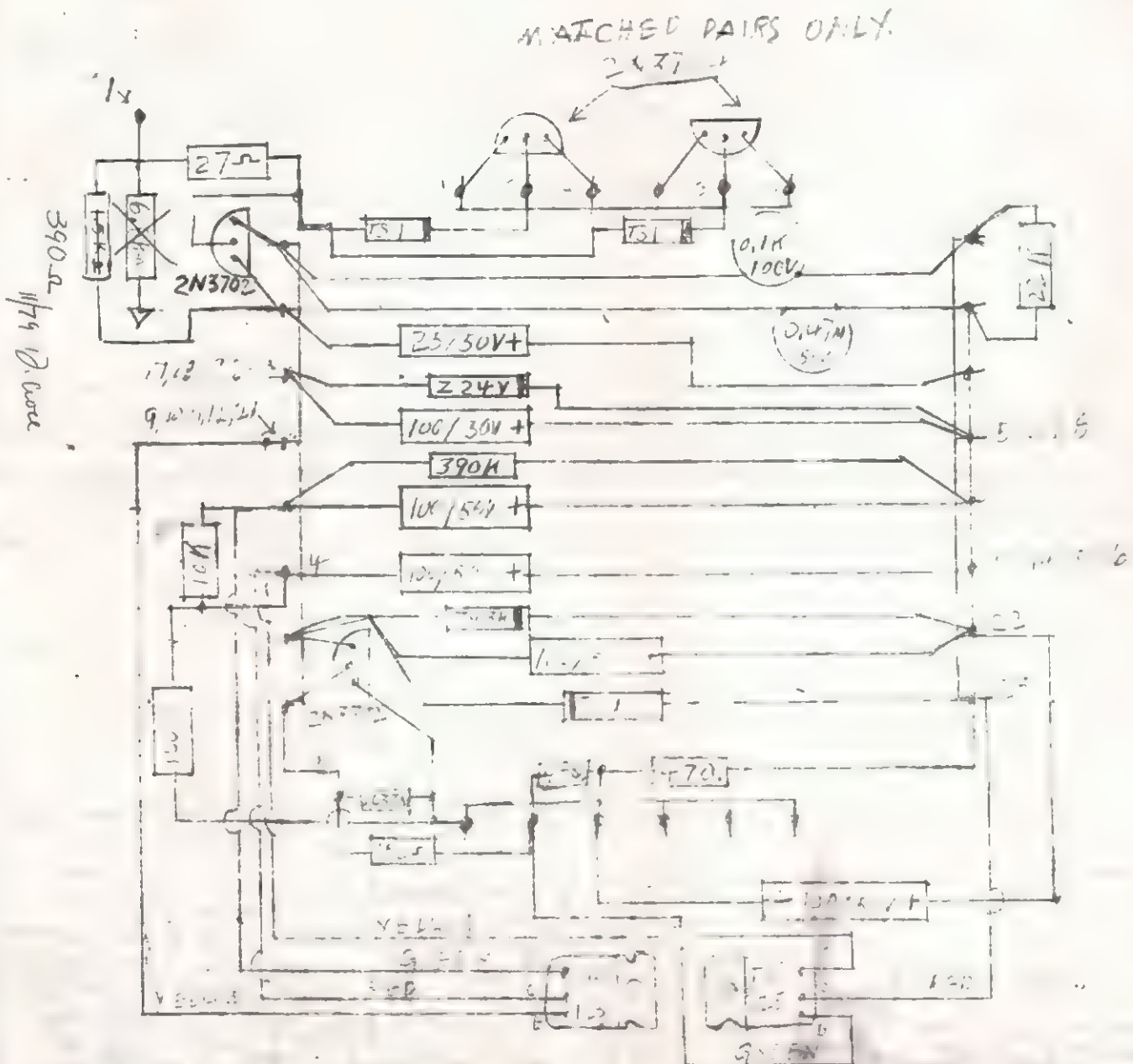
233 225
233 225

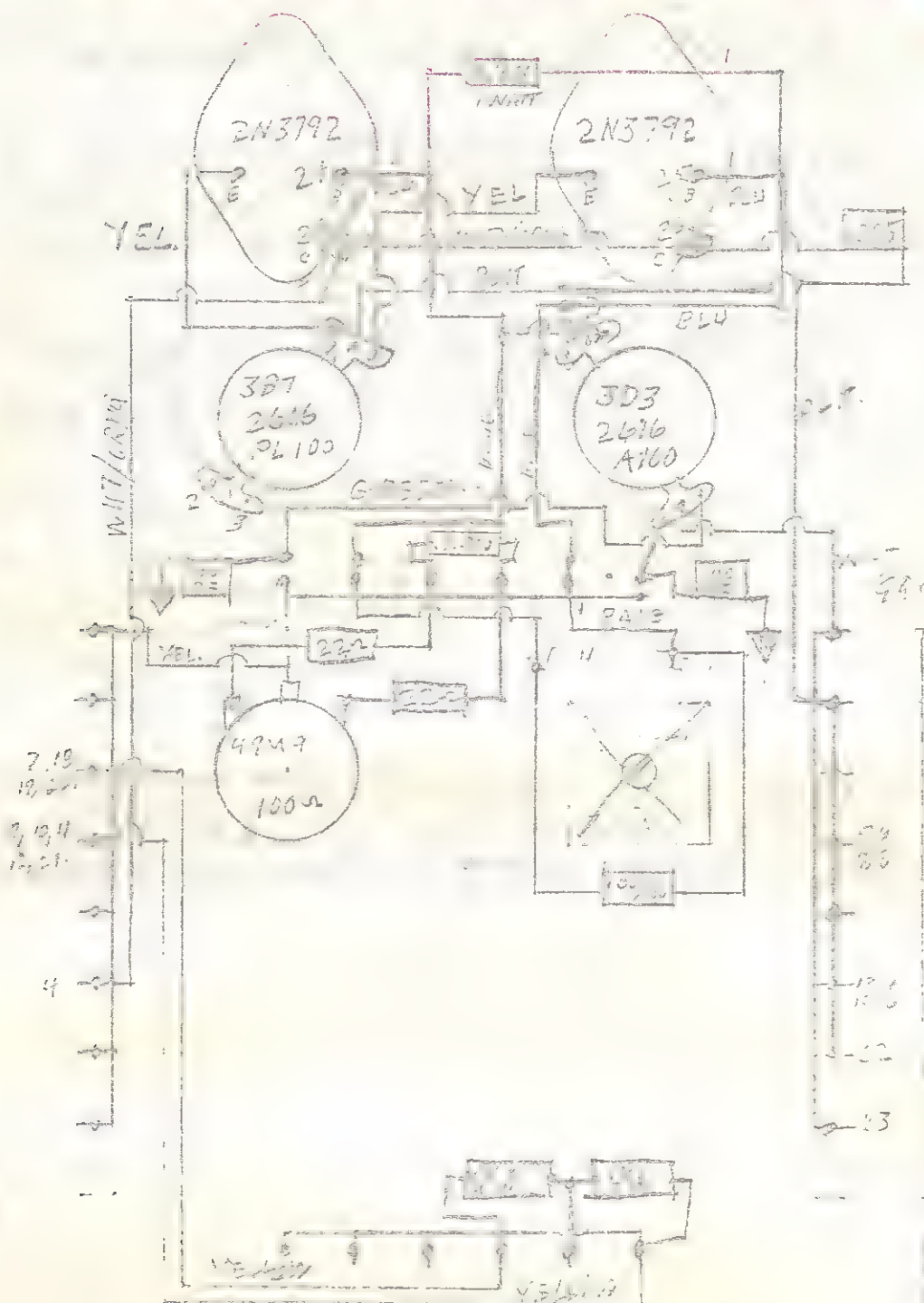


WIRE CODE	
1	VIOLET - H 11.
2	WHITE - BDFH - 13
2	WHITE - RACES - 12
4	BLUE - S - 11K
5	P - A - 10
6	BLACK - C - 10
7	BLACK - E - 10
8	BLACK - G - 10
9	ORANGE - B - 9
10	ORANGE - D - 9
11	ORANGE - F - 9
12	ORANGE - H - 9
13	BLACK - A - 8
14	BLACK - B - 8
15	BLACK - C - 8
16	BLACK - D - 8
17	BLACK - E - 8
18	BLACK - F - 8
19	BLACK - G - 8
20	BLACK - H - 8
21	WHITE - 10K
22	RED - 10K
23	BROWN - 10K

811D BIAS SUPPLY

PAGE 2

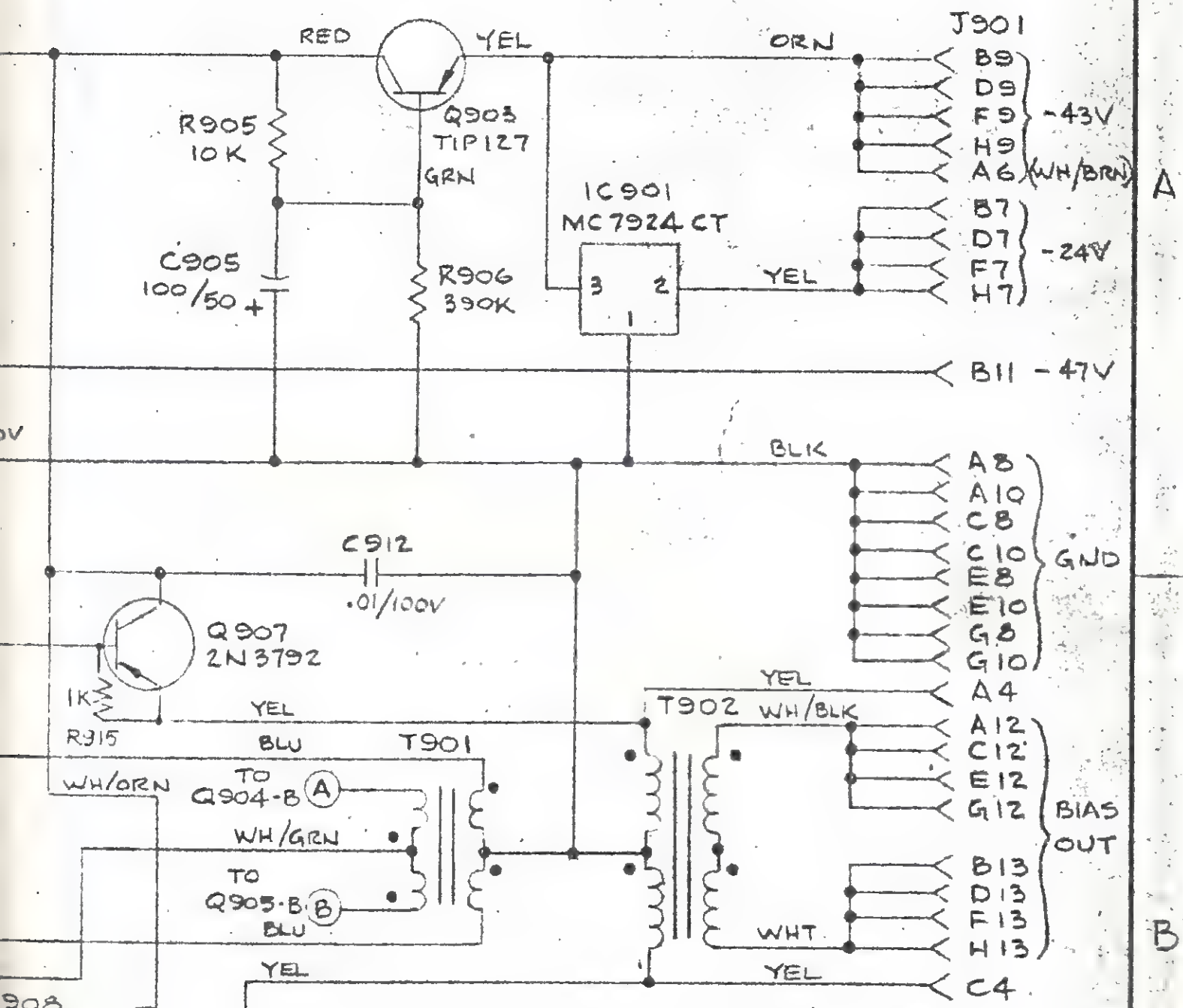




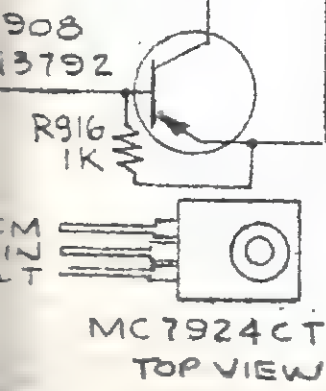
BIAS CONNECTIONS WIRE CODE

1. VOLT - H 11
2. ANTE BOPH-13
3. ANTE BOPH-12
4. BLUE - 3 - 11K
5. PANT - A - 10
6. BLACK - C - 10
7. BLACK - E - 10
8. BLACK - G - 10
9. PANG - B - 9
10. OR - V - 9
11. OR - F - 9
12. OR - H - 9
13. BLACK - A - 8
14. BLACK - C - 8
15. BLACK - E - 8
16. BLACK - G - 8
17. VOLT - F - 7
18. VOLT - H - 7
19. VOLT - 10
20. VOLT - 11
21. VOLT - 12
22. VOLT - 13
23. VOLT - 14
24. VOLT - 15
25. VOLT - 16
26. VOLT - 17
27. VOLT - 18
28. VOLT - 19
29. VOLT - 20
30. VOLT - 21
31. VOLT - 22
32. VOLT - 23
33. VOLT - 24
34. VOLT - 25
35. VOLT - 26
36. VOLT - 27
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38. VOLT - 29
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90. VOLT - 81
91. VOLT - 82
92. VOLT - 83
93. VOLT - 84
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96. VOLT - 87
97. VOLT - 88
98. VOLT - 89
99. VOLT - 90
100. VOLT - 91
101. VOLT - 92
102. VOLT - 93
103. VOLT - 94
104. VOLT - 95
105. VOLT - 96
106. VOLT - 97
107. VOLT - 98
108. VOLT - 99
109. VOLT - 100

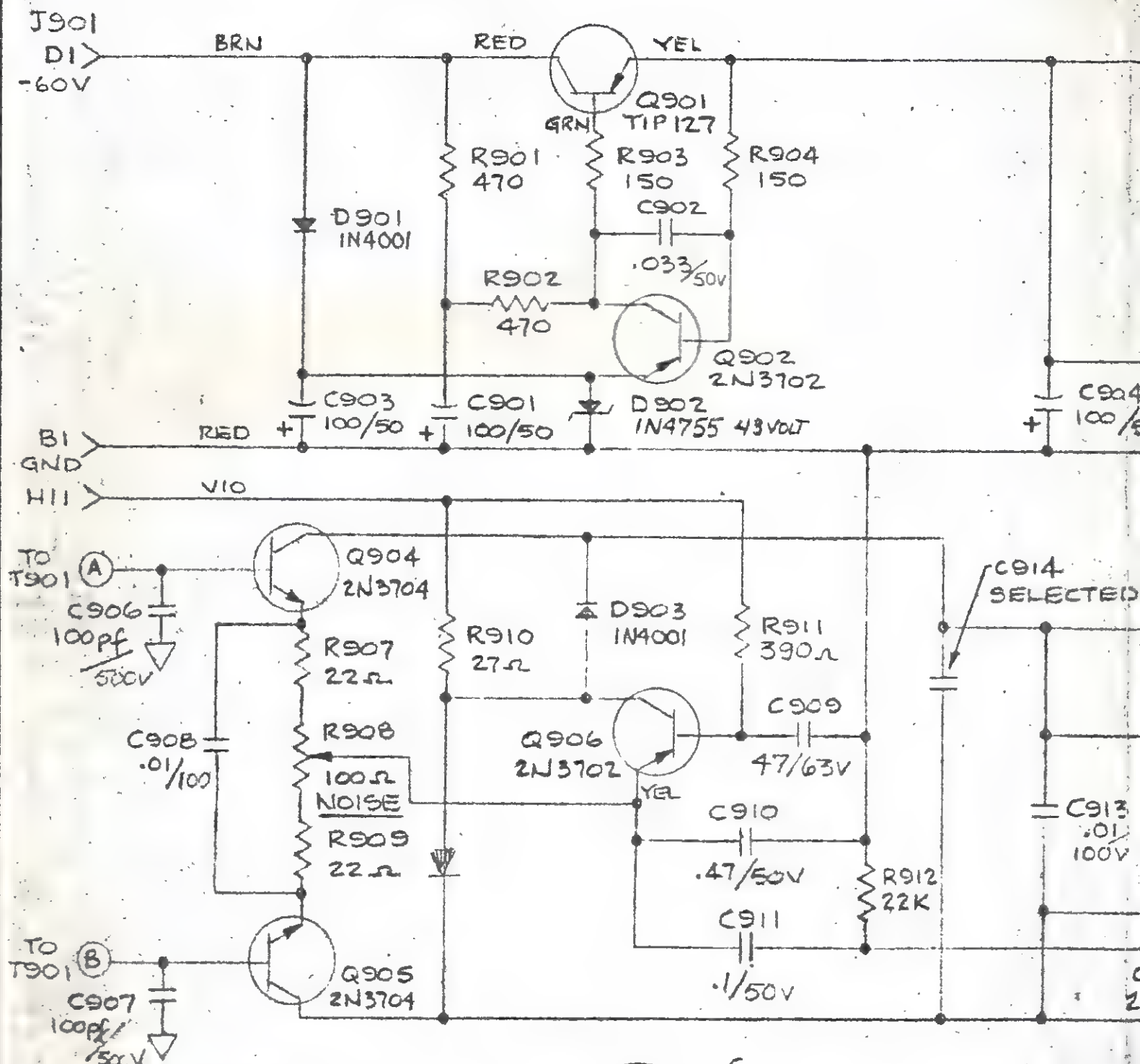
REVISIONS			
LTR	DESCRIPTION	DATE	BY
A	WAS DWG. NO. 110902-C MODEL WAS 8213, REMOVE R913, R914 R911 WAS 1.5K C909 WAS 25/50V	1-23-81	B. CLOKE



STEPHENS ELECTRONICS, INC.		
SCALE: ~	APPROVED BY:	DRAWN BY GEIER
DATE: 8 OCT 79		REVISED 1-21-81
BIAS OSCILLATOR MODULE		
MODEL 811D	FIGURE 6-7	DRAWING NUMBER SC-0901A



ALL RESISTORS 1/4 WATT
ALL CAPACITORS IN MICROFARADS
(UNLESS OTHERWISE NOTED)



LAST SYM NO. USED	NOS. OMITTED
C 914	
D 903	
Q 908	
R 916	R913, R914

B
C
E

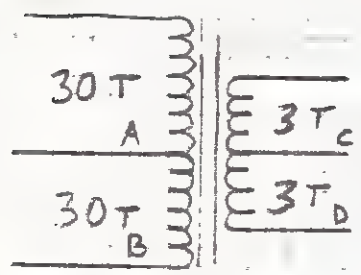
2N3702
2N3704
BOTTOM VIEW

2N3792
BOTTOM VIEW

TIP 127
TOP VIEW

9/12/74 RANDY

BIAS CHASSIS COILS O.S.C. TRANS



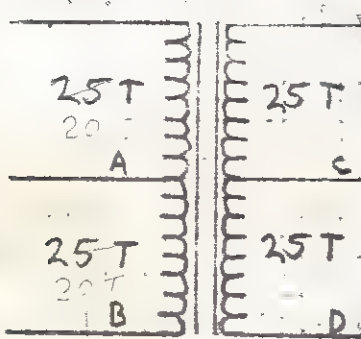
30 TURNS OF #24 SOLID ENAMEL COATED WIRE BELDON #8052

3 TURNS OF #26 SOLID ENAMEL COATED WIRE BELDON #~~8052~~ 8065

WIND 2 WIRES AT A TIME, THE 30'S 1ST, THEN THE 3'S

BOBIN # 2616 PCB1 SEPERATED BY TAPE
CORE # 2616P A100-3D3

STANDARD OUTPUT - ERASE



25 TURNS OF #24 SOLID ENAMEL COATED WIRE BELDON #8052

WIND 4 WIRES AT ONE TIME

CUT THE 4 WIRES TO A LENGTH OF 56 INCHES BEFORE TURNING

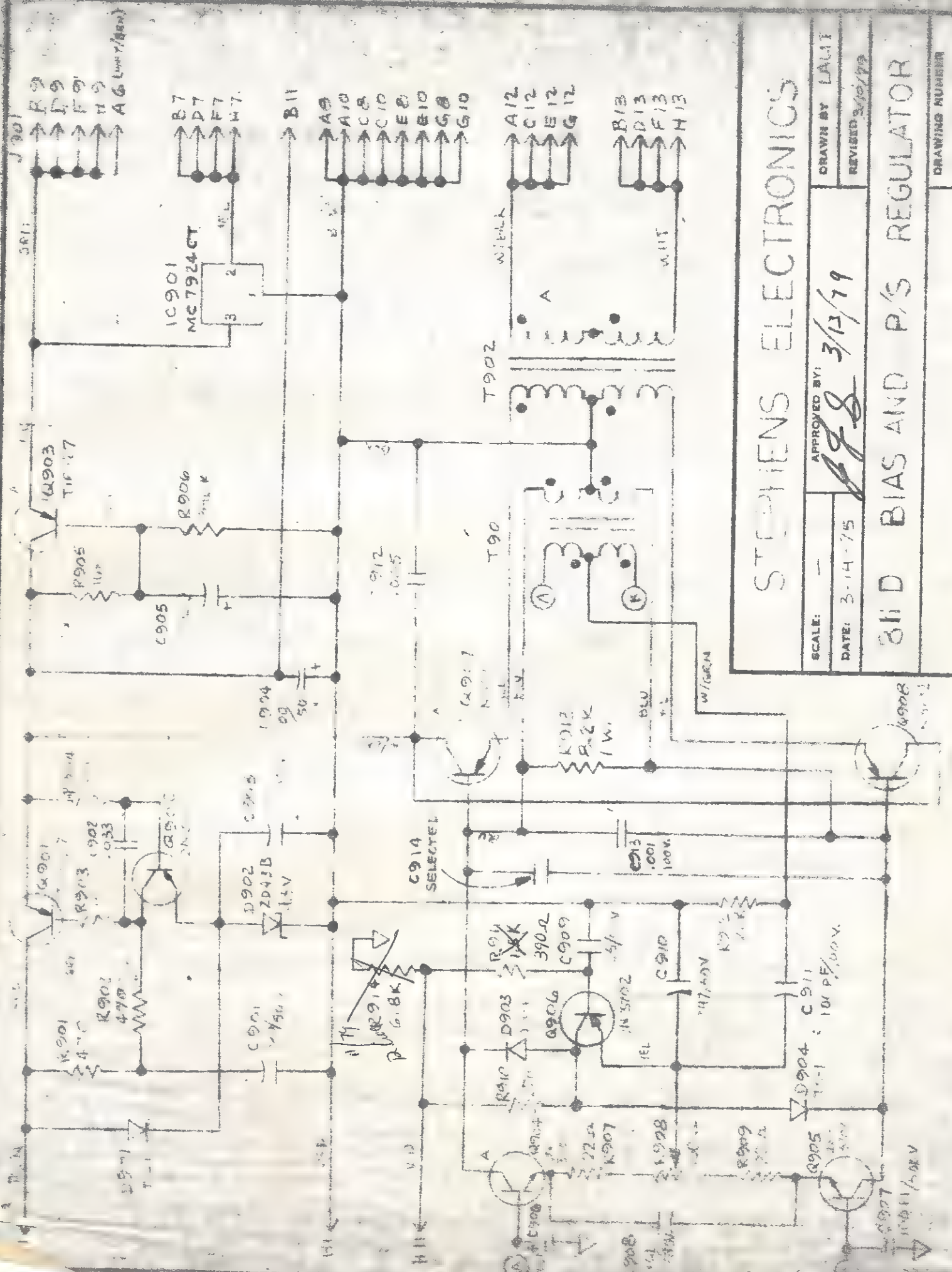
BOBIN # 2616 PCB1
CORE # 2616 PL100 3B7

CORES AND BOBINS FROM FERROXCLUBE CORP.



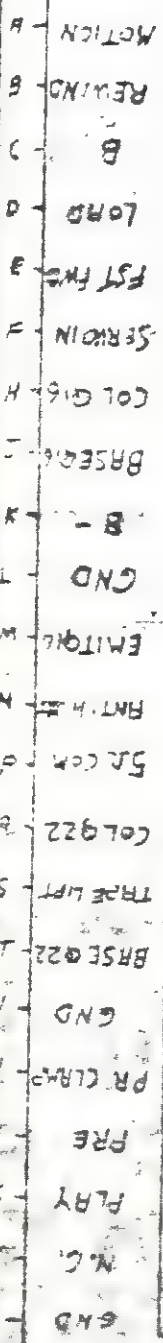
WRAP COILS WITH TAPE
WHEN FINISHED AND
CHECK FOR GOOD FIT
IN CORES

22 5
22 5
22 5
22 5
22 5



STEPHENS ELECTRONICS	
SCALE: -	APPROVED BY: <i>[Signature]</i>
DATE: 3-14-75	3/13/79
DRAWN BY: LAUT	
REVISED: 3/10/79	
2H D BIAS AND P/S REGULATOR	
DRAWING NUMBER: 10000-C	

master copy



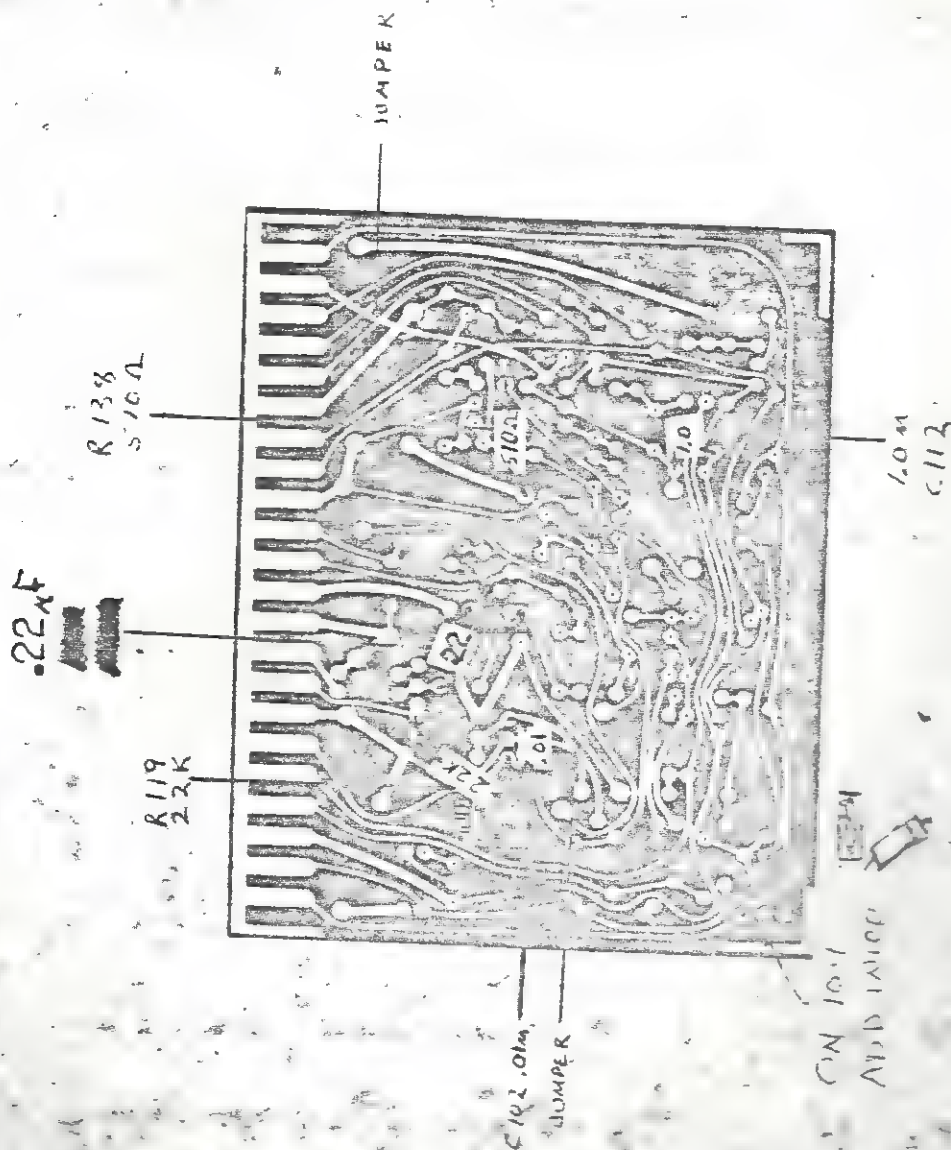
STEPHENS ELECTRONICS, INC.		DRAWN BY PKW	
APPROVED BY:		REVISED	
SCALE: 2:1	DATE: 10/10/74		
		MILWAUKEE	

MAILED
APR 21 1964

01010000

WIRTSCHAFTS UNIVERSITÄT

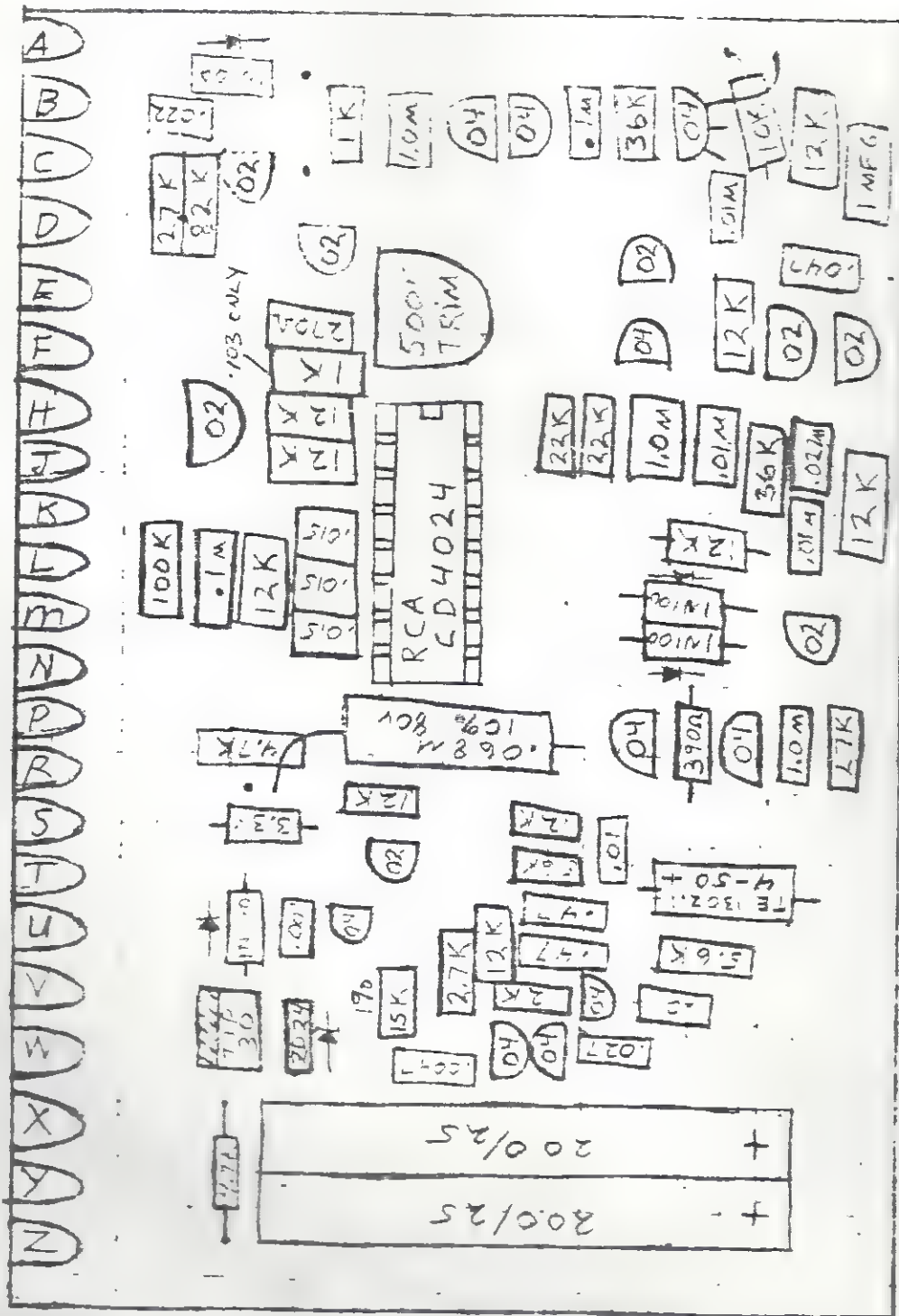
811D-103



211D-103

103- ADD 1K
104- NO 1K

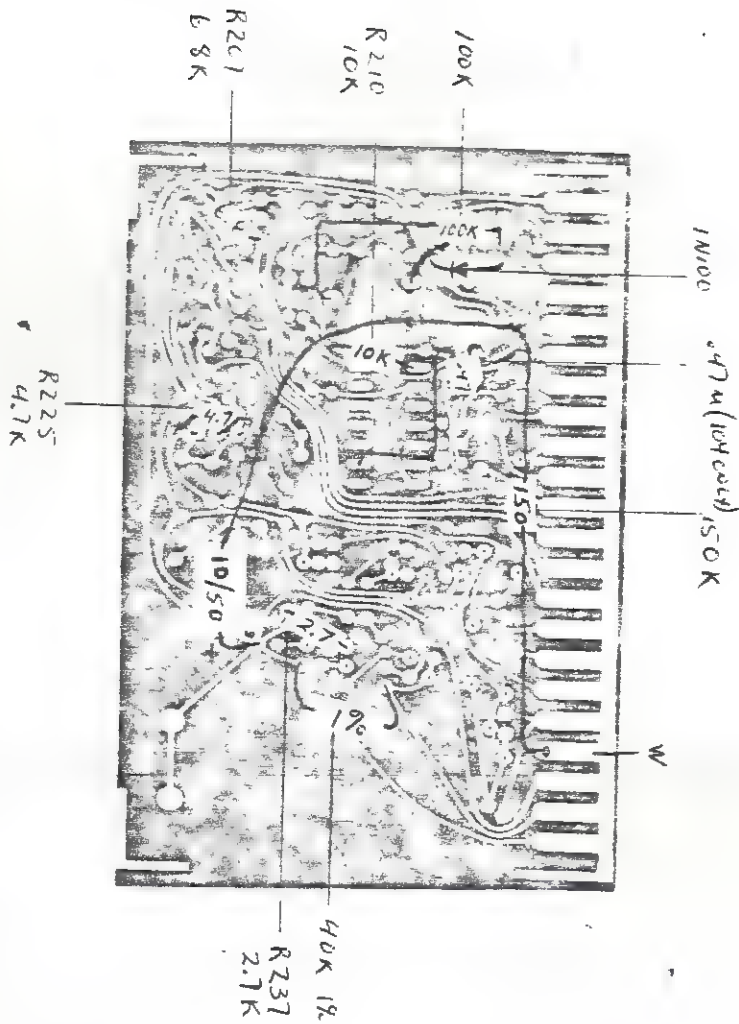
2/3/76



310104

103-104

5/17/76



103 - NO .47u CAP
104 - ADD .47u CAP

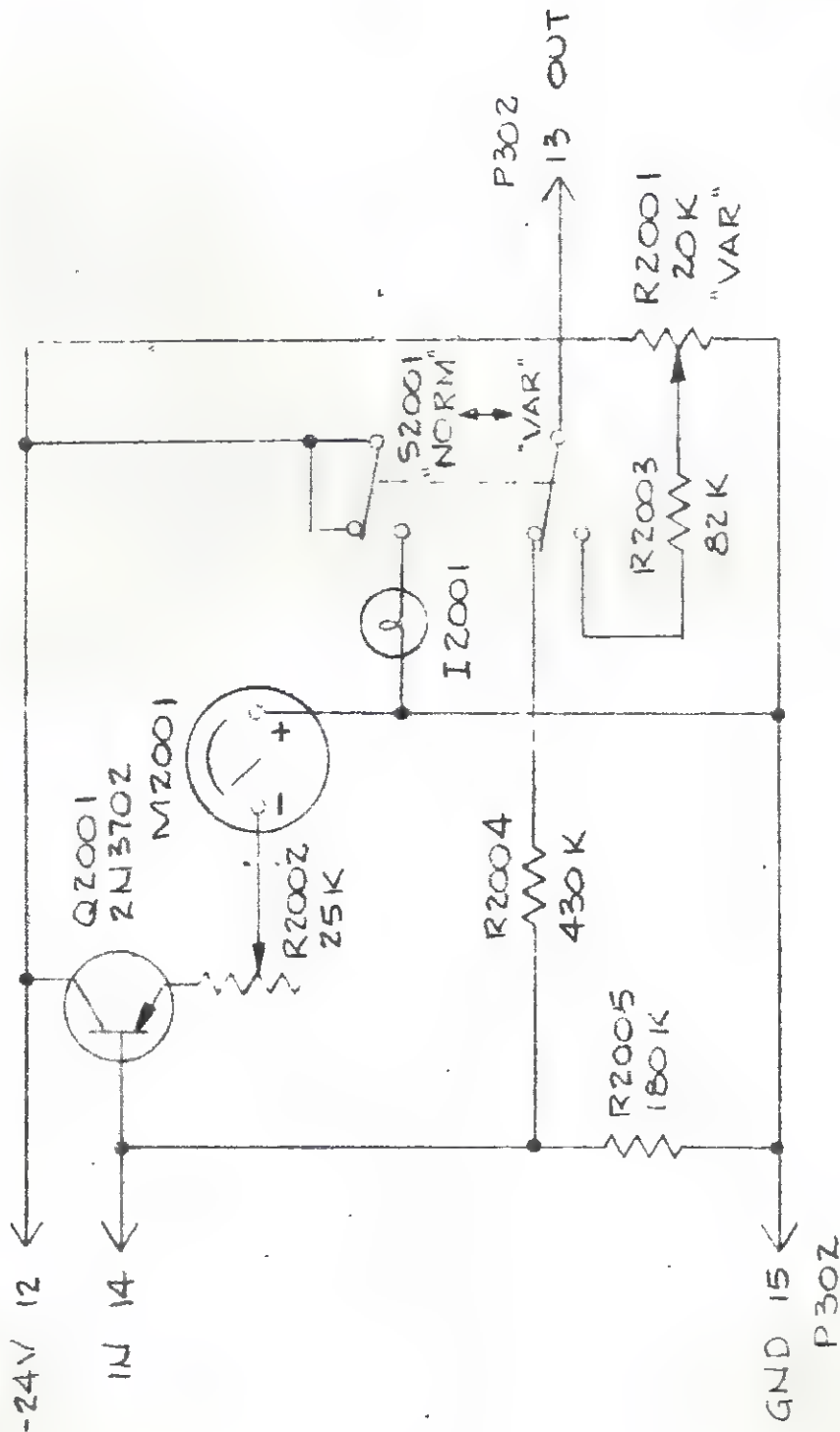
REVISIONS

BY

DATE

DESCRIPTION

LTR



STEPHENS ELECTRONICS, INC.

DRAWN BY GEF 12

REVISED

APPROVED BY: *[Signature]*

DATE: 24 SEP 79

VSO MODULE

MODEL 821-B

FIGURE 6-17

DRAWING NUMBER

5C-2001

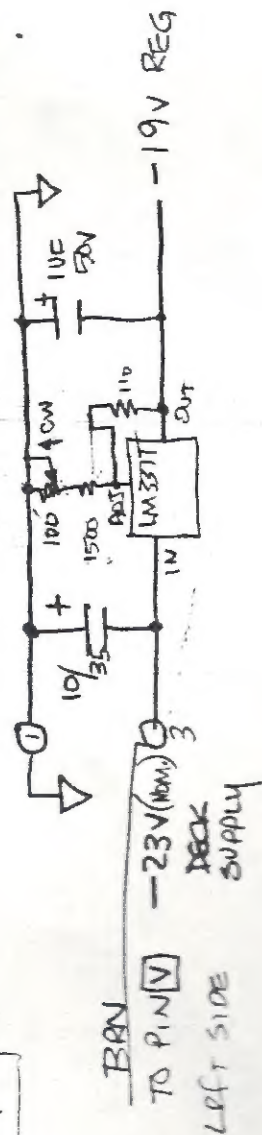
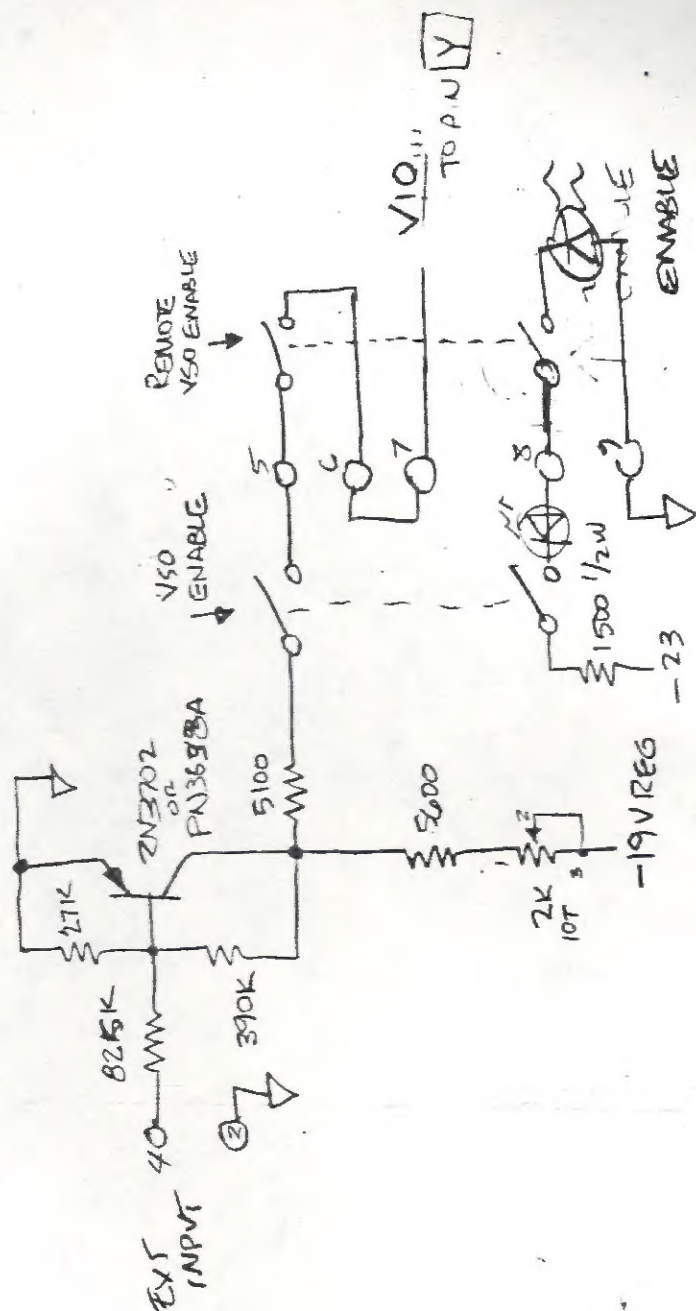


2N3702

BOTTOM VIEW

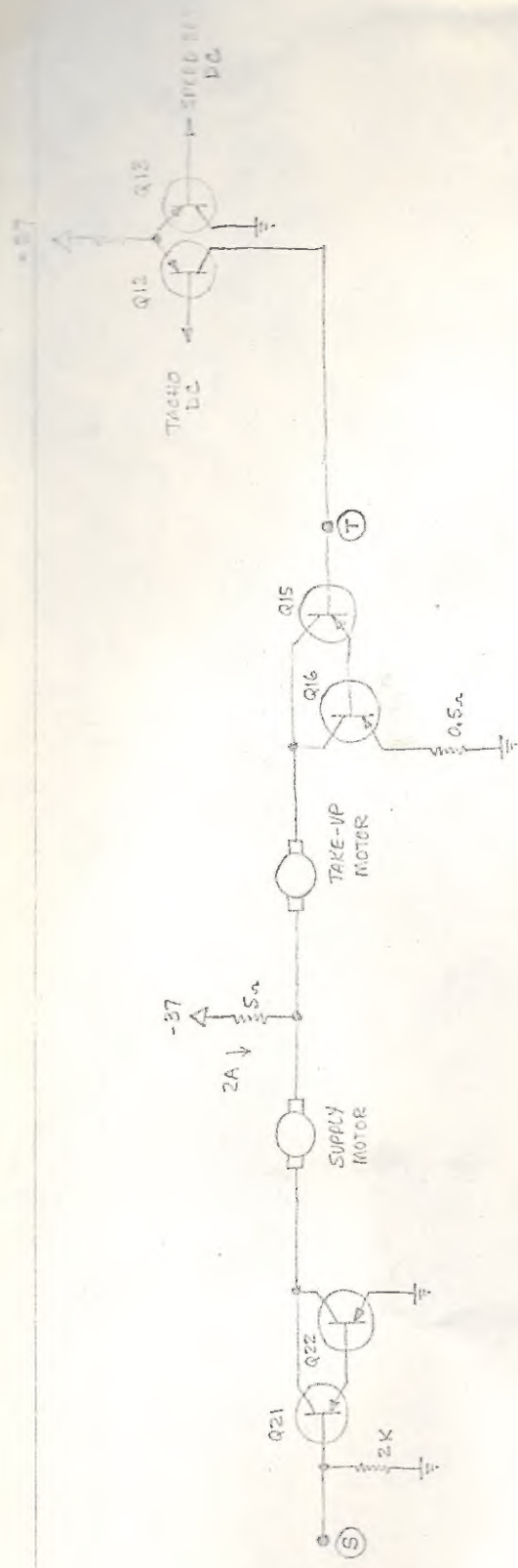
FIGURE 6 - 1

$+1.524 = -16.07$
 $-1.42 = -12.75$
 $-1.365 = -9.53$



1 2 3 4 5 6 7 8 9

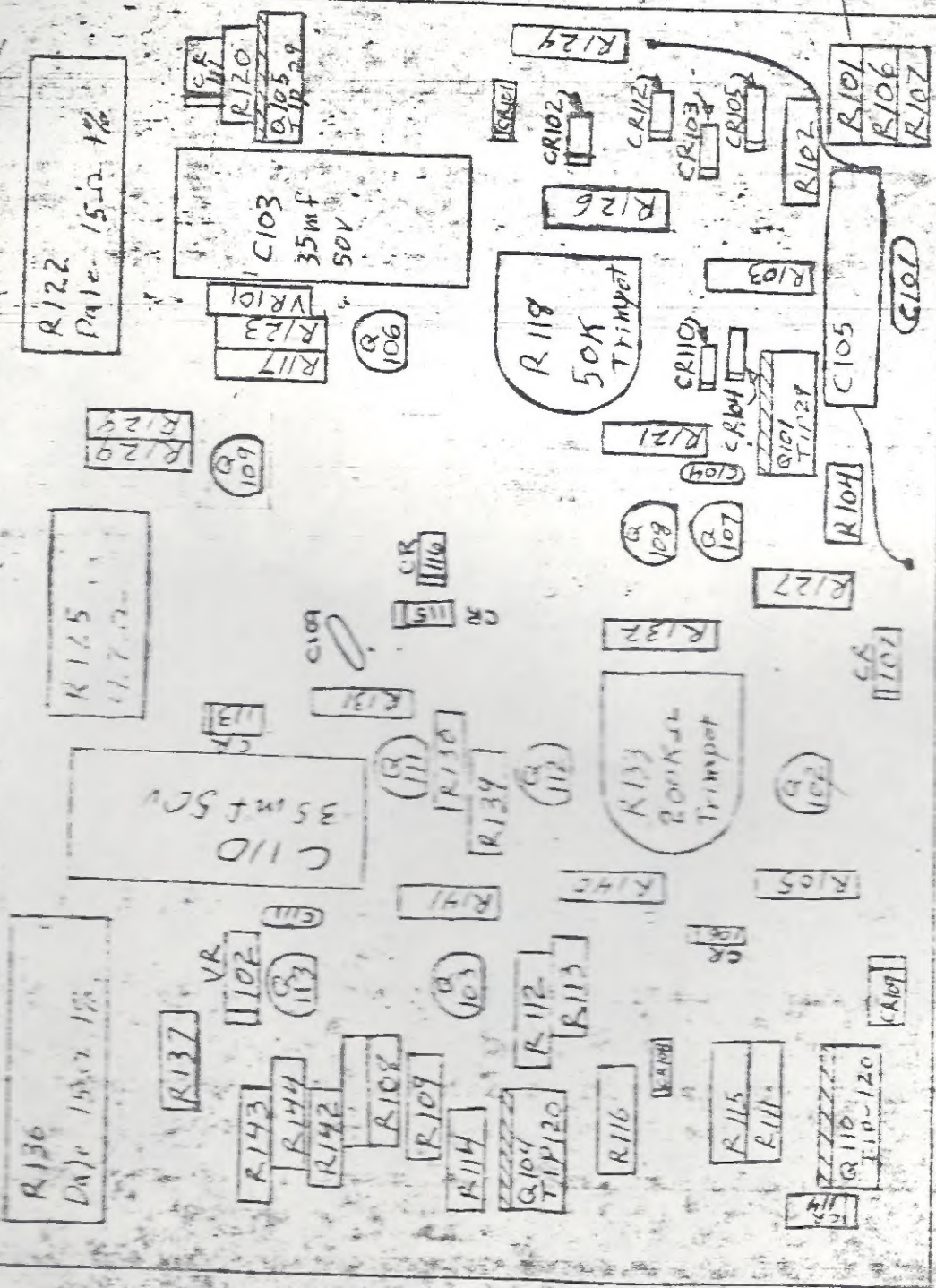
INTRODUCTION



Simplified Servo

Servo Card
Data Amplifier
Modification
April 6, 1977

END N.C. P.W. PRE BE CARB GND
EFFECT TAP LTR COL 422 S.A. CAP. PRINTING EMITTING GND
B - BRSE COL 410 SERVO IN FST FWD LOAD B REV/RZ ACTION



Top View

STEPHENS ELECTRONICS, INC.

SCALE 2:1		APPROVED BY:		DRAWN BY PKW	
DATE 10/10/74				REVISED	
Servo Card # 310163					
				DRAWING NUMBER 310163	